

THE REPORT OF THE CHIEF VETERINARY OFFICER

# Animal Health 1995

Ministry of Agriculture, Fisheries and Food  
Scottish Office of Agriculture Environment and Fisheries Department  
Welsh Office Agriculture Department

HMSO

# The Objectives of the State Veterinary Service

## The Prevention and Control of Animal Diseases

*To prevent the importation of animal diseases, particularly exotic diseases, through national and EC measures.*

*To control and/or eradicate all notifiable diseases.*

*To assist the industry in the control of non-notifiable diseases.*

## Farm Animal Welfare

*To encourage high standards of animal welfare on farms, during transport, at markets, in abattoirs, and as far as possible, on export.*

*To explain government policies on farm animal welfare.*

*To provide support for the Farm Animal Welfare Council (FAWC) and act as appropriate on its recommendations.*

## Livestock Protection

*To improve the health status and genetic quality of farm livestock by the establishment of voluntary disease control schemes, and regulatory control over artificial insemination and embryo transplantation.*

*To support the export trade by the establishment of herds and flocks of known health status.*

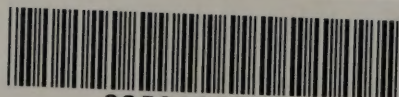
## Veterinary Medicines

*To encourage the proper use of medicines.*

## Veterinary Public Health and Export Promotion

*To provide safeguards for public health in the production and import of meat.*

*To facilitate exports of live animals, meat and other animal products by doing everything possible to ensure that the animal health and public health requirements of importing countries are met.*



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MINISTRY OF AGRICULTURE, FISHERIES AND FOOD  
SCOTTISH OFFICE AGRICULTURE, ENVIRONMENT AND FISHERIES DEPARTMENT  
WELSH OFFICE AGRICULTURE DEPARTMENT

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# Animal Health 1995

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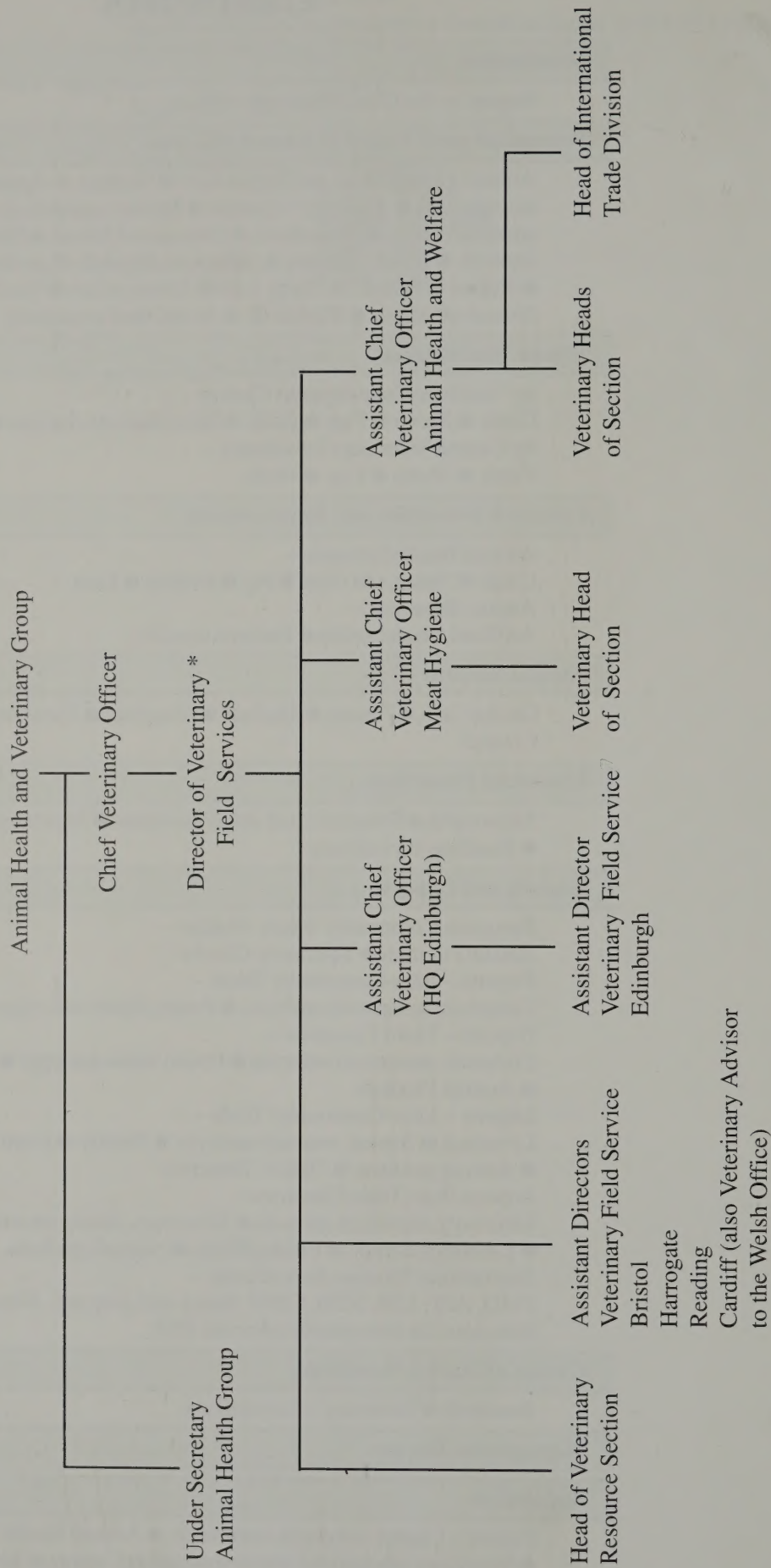


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# Animal Health and Veterinary Group

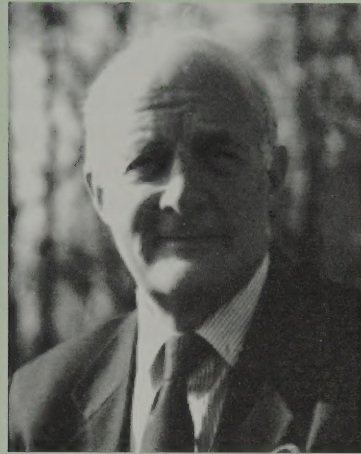
## Senior Management Structure



\* The Veterinary Investigation Service became part of the Veterinary Laboratories Agency on 1 October 1995



# Introduction



Animal Health 1995 provides a picture of the many and varied responsibilities of the Animal Health and Veterinary Group throughout 1995. Each year brings its own interesting developments and 1995 was no exception. BSE continued its downward trend and new control measures were introduced, new rules for safeguarding the welfare of animals in transit were adopted, and further steps were taken towards EC harmonisation and the Single Market with the introduction of new animal identification and veterinary checks procedures. The wet start to the year, followed by a long, hot Summer, and freezing temperatures in November and December brought its own problems for livestock farmers.

The Report is presented in a number of chapters each providing a detailed summary of developments in the areas of disease control, disease surveillance, livestock protection and improvement, animal welfare, consumer protection and international trade.

Disease control issues continued to play a major part in the work of the Veterinary Field Service(VFS) and the Veterinary Investigation Service (VIS). Significant ground work continued in the areas of bovine tuberculosis control and brucellosis monitoring. New developments during the year included the introduction of statutory controls for equine viral arteritis, creating a precedent for “user-friendly” measures adaptable to the needs of the industry, and renewed concern about sheep scab. Movement control measures are, of course, integral to preventing the spread of disease, and 1995 was a formative year for the introduction of improved animal identification and registration procedures for pigs, sheep and goats.

In its final year as part of the CVO's Group, the VIS recorded a wide range of problems, ranging from those linked to weather factors to isolated conditions with specific causes. The chapter on “Disease Surveillance” provides a comprehensive account of the year's findings.



A less prominent, but important area of work is that carried out on livestock protection and improvement, particularly where these are fundamental to maintenance of a healthy trade within the domestic and international markets. During the year arrangements were made for the private sector to take over the greater part of the Cattle Health Scheme and the Sheep and Goat Health Scheme, leaving the Government with a greater focus on those areas such as herd and flock freedom from the notifiable diseases EBL and scrapie, where monitoring plays such a vital role.

In the field of consumer protection considerable progress was made in a number of areas, including the control of salmonellosis. The Meat Hygiene Service consolidated its legislative position and assumed greater control for public health issues.

Animal welfare remained a subject of intense public interest, creating a heavy work load for the VFS, both in the establishment of new export routes and in negotiations in Brussels.

Although the number of imported cattle dropped significantly from 1994 levels, exports of calves and sheep were maintained at 1994 levels, while exports of breeding pigs and horses increased. Commercial opportunities were improved with the accession of Austria, Finland and Sweden to the European Community, as explained in the chapter on Exports and Imports.

Viewed against the back drop of a major management review and re-organisation, as outlined in the chapter 'Review of the Animal Health and Veterinary Group', the staff of the VFS and the VIS have done particularly well to maintain the front-line service so effectively. As the VIS has now become a part of the Veterinary Laboratories Agency, I would like to wish all its staff well for the future. Finally, I would like to thank all staff for their teamwork and dedication in effectively meeting the demands of 1995 and I look forward to working with them to meet the new challenges of 1996.



## Prevention and Control of Animal Diseases

*Great Britain enjoyed a further year of freedom from the major notifiable diseases of livestock. For the third successive year, there was a fall in the number of cases of bovine spongiform encephalopathy confirmed during the year. There were no confirmed cases of brucellosis. The number of outbreaks of bovine tuberculosis was approximately the same as in 1994. No cases of warble fly were confirmed in domestic cattle, but one clinically affected imported animal was returned to its country of origin. The incidence of viral haemorrhagic disease of rabbits increased, and the disease spread in the wild rabbit population.*

### Animal identification and registration

The Bovine Animals (Records, Identification and Movement) Order 1995 and Pig (Records, Identification and Movement) Order 1995 were issued to implement Council Directive 92/102/EEC. The necessary consultation with the industry delayed the corresponding Sheep and Goats Order, but this legislation will be issued early in 1996 to coincide with the beginning of the sheep marketing year.

All cattle born after 1 April 1995 must be identified with the new format ear tag showing the letters "UK". Tag manufacturers must now also record the issue of these tags on the new Ear Tag Allocation System computer (ETAS). An industry working group was established to monitor the implementation of the arrangements.

In April, the House of Commons Agriculture Select Committee published its Report on the Identification and Registration of Farm Livestock. The Report made reference to the potential use of electronic data recording systems in livestock management. The Government agreed to consult the industry and to take account of the Committee's views in preparing the UK contribution to the review of European legislation on animal identification which is due in 1996.

### Anthrax

#### *Investigations of suspected anthrax*

**There was one outbreak of anthrax in 1995, in which one heifer died.**

Ministry veterinary staff and private veterinary surgeons working as Local Veterinary Inspectors investigated 7903 suspect cases of anthrax during 1995. Samples were sent to the Central Veterinary Laboratory, Weybridge for further investigation on 16 occasions. Only one case was confirmed.

The single confirmed case occurred in the Nene Valley of Northamptonshire, an area where there were formerly many tanneries and where anthrax has frequently occurred in the past. The affected farm had had an outbreak in 1982. The dead animal was from a group of yarded heifers fed on silage made from the meadow in which the 1982 case had died.



Table 1.1 Anthrax cases in Great Britain 1991 - 1995

Year	No. of Investigations	Incidents	Deaths Animals Species	Animals Number	County
1991	9280	2	Cattle Cattle	1 1	Nottinghamshire Strathclyde
1992	8516	2	Cattle Cattle	1 1	Derbyshire Clwyd
1993	8662	2	Cattle Cattle	1 4	Derbyshire Highlands
1994	8301	3	Cattle Cattle Cattle	3 1 1	Gloucestershire Isle of Wight Wiltshire
1995	7902	1	Cattle	1	Northamptonshire

## Vaccine

Private veterinary surgeons were supplied with 825 doses of vaccine for use in their clients' stock. The Central Veterinary Laboratory holds 6,700 doses for immediate issue, and 57,000 doses are held as bulk concentrate. The vaccine is used under an Animal Test Certificate (ATC), but an application for a Product Licence is being prepared with a deadline of 1997.

## Research and development- Porton Down

The Expert Group set up after an anthrax outbreak in Wales during 1989 considered the results of the research project on anthrax in pigs reported in Animal Health 1994. The group concluded that healthy pigs from an infected premises could safely be moved to slaughter for human consumption 21 days after the last anthrax case on the premises, and that there is no risk to abattoir workers handling the carcasses, nor to those preparing the meat or consuming it.

## Approval of disinfectants

**The approval of disinfectants is regulated by Orders made under the Animal Health Act 1981.**

Schedule 1 to the Diseases of Animals (Approved Disinfectants) Order 1978 lists the disinfectants appropriate for notifiable disease control purposes and the dilution rates to be used. It was brought up to date by the Diseases of Animals (Approved Disinfectants) (Amendment) Order 1994. At the end of the year there were 248 approved disinfectants listed, with no changes to the approved list during 1995.

## Aujeszky's disease

**Great Britain remained free from Aujeszky's disease (AD) in 1995, the last outbreak having occurred in October 1989.**

## Reports and surveillance

There were two reports of suspected Aujeszky's disease: one involved incoordination and increased mortality of young pigs, and the other a cat with dermatitis, severe pruritis and behavioural changes. The possibility of Aujeszky's disease was ruled out in each case by serological testing of blood samples. The symptoms in the pigs were attributed to streptococcal meningitis, and the cat recovered following treatment for parasitic dermatitis.

The survey of culled breeding boars at slaughterhouses continued. Antibodies to AD virus were not detected in any of the 15,128 serum samples tested during 1995.

Veterinary Investigation Centres continued to screen pig herds for Aujeszky's disease as part of routine diagnostic investigations. During the year, 4,498 serum samples from 892 herds were screened, all with negative results.

Table 1.2 shows the results of testing for antibodies to Aujeszky's disease virus in serum samples collected at abattoirs in Great Britain.



Table 1.2 Summary of serum sampling at abattoirs 1986 - 1994

Year	No. of samples collected		Positive Incidents
	Sows	Boars	
1986	56,865	12,183	13
1987	53,655	12,117	5
1988	20,942	19,959	1
1989	38,389	17,701	5
1990	18,144	12,030	0
1991	18,239	15,196	0
1992	0	14,012	0
1993	0	13,531	0
1994	0	14,318	0
1995	0	15,128	0

### *Aujeszky's disease - Research and development (CVL, Weybridge)*

The ELISA used for preliminary screening of samples for the Aujeszky's disease serum survey is based on a recombinant glycoprotein gD expressed in baculovirus. In 1995 the test was improved by the development of a new method for stabilising the antigen.

An ELISA using recombinant gE can distinguish antibodies induced by field virus from responses to gE-deleted vaccines. The sensitivity of this ELISA has been improved by the construction of a recombinant baculovirus plasmid carrying the Aujeszky's disease virus genes coding for gE and gI. This improved ELISA is now ready for production. Although Aujeszky's disease vaccine is not used in Great Britain, the gE ELISA test may be used in some circumstances for post-import testing of pigs.

#### Reference

Banks, M.; Tehrani, B.; Weightman, S. (1995) . Aujeszky's disease ELISA using glycoprotein gE (gI) expressed in baculovirus. Schwyzer, M.; Ackermann, M.; Bertoni, G.; Kocherhans, R.; McCullough, K.; Engels, M.; Wittek, R.; Zanoni, R., (editors). Immunobiology of Viral Infections: Proceedings of 3rd Congress of European Society for Veterinary Virology; 1994; Interlaken, Switzerland. Lyon, France: Fondation Marcel Mérieux: 137-141

### **Bovine spongiform encephalopathy**

A significant decline of 40% in reported cases provided further evidence of the effect of the ruminant feed ban. The number of cases confirmed in cattle that were born after 18 July 1988 increased to 24,329. The search continued for evidence which might confirm that such cases were caused by a route of exposure other than feed. There is still no evidence that vertical or horizontal transmission have played a part in the continuation of the epidemic. Evidence of potential continued feed borne exposure, albeit at reduced levels, came from the discovery that specified bovine offals were sometimes rendered with other animal wastes, and so could enter the animal food chain. Cross contamination from feed produced for pigs and poultry (which could legitimately contain meat and bone meal), was the most likely cause. This led to further tightening of rules concerning the disposal of specified bovine offals, and preparations were made to introduce at the beginning of 1996 surveillance of ruminant feeds for the presence of mammalian protein. This surveillance will involve unannounced collection of feed samples at mills, and will reinforce voluntary sampling on farm that has been in place since mid-1994.

The decline in the epidemic accelerated in 1995 as the ruminant feed ban of July 1988 began to affect the incidence of disease in six year old animals. The reduction in cases placed under restriction during the year was 40% compared with 1994, and 58% relative to 1993. The progress of the epidemic is depicted diagrammatically in Figures 1.1 to 1.7, and in tabular form in Table 1.3. Data for earlier years have been updated in Table 1.3 as further cases have been confirmed, and the number of cases confirmed in 1995 is still provisional. Because of the time lag between clinical onset, report and eventual confirmation, Figure 1.3 terminates at the end of October 1995 because data are incomplete for cases with later clinical onset.

Table 1. 3 – Summary of reported and confirmed cases of BSE 1988 to 1995

	Animals placed under restriction	Animals slaughtered	BSE confirmed
1988	2516	2376	2184
1989	8447	8061	7137
1990	17323	16641	14181
1991	30009	29026	25032
1992	44846	43155	36681
1993	42932	41085	34371
1994	30261	28703	23943
1995	17947	17140	13999

Where appropriate, figures for previous years have been amended.

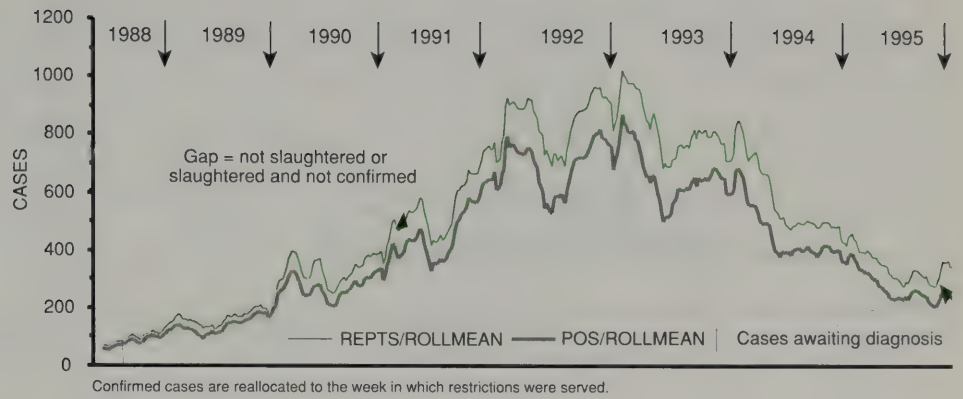
Changes in incidence of disease in specific age groups are summarised in graphic form in Figure 1.5 and in tabular form in Table 1.4.

Table 1. 4 – Changes in incidence of disease in specific age groups

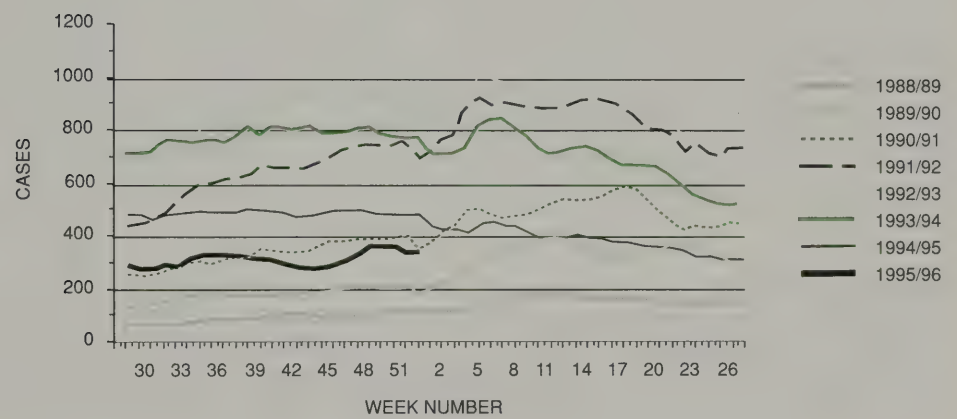
BSE AFFECTED HERDS: CASES WITH CLINICAL ONSET IN 1989				BSE AFFECTED HERDS: CASES WITH CLINICAL ONSET IN 1990			BSE AFFECTED HERDS: CASES WITH CLINICAL ONSET IN 1991			BSE AFFECTED HERDS: CASES WITH CLINICAL ONSET IN 1992			BSE AFFECTED HERDS: CASES WITH CLINICAL ONSET IN 1993			BSE AFFECTED HERDS: CASES WITH CLINICAL ONSET IN 1994			BSE AFFECTED HERDS: CASES WITH CLINICAL ONSET IN 1995*			RANGE OF DATES OF BIRTH
Age yrs	No. Animals at risk	No. of cases of BSE	Incid- ence (%)	No. Animals at risk	No. of cases of BSE	Incid- ence (%)	No. Animals at risk	No. of cases of BSE	Incid- ence (%)	No. Animals at risk	No. of cases of BSE	Incid- ence (%)	No. Animals at risk	No. of cases of BSE	Incid- ence (%)	No. Animals at risk	No. of cases of BSE	Incid- ence (%)	No. Animals at risk	No. of cases of BSE	Incid- ence (%)	
1	0	1	0.00	0	0	0.00	0	0	0.00	0	0	0.00	0	0	0.00	0	0	0.00	0	0	0.00	Born after 18/07/88
2	23461	17	0.07	33843	21	0.06	46533	11	0.02	54120	11	0.02	50880	7	0.01	39331	4	0.01	26471	3	0.01	
3	43299	337	0.78	62904	838	1.33	86447	1626	1.88	100162	663	0.66	93198	404	0.43	72817	176	0.24	49036	165	0.34	
4	38265	1301	3.40	55259	2183	3.95	76328	4396	5.76	88114	5889	6.68	80750	2655	3.29	62518	1439	2.30	42392	694	1.64	Born before 18/07/88
5	33016	1150	3.48	46994	1629	3.47	64162	2518	3.92	73930	4845	6.55	67554	5525	8.18	51605	2397	4.64	34746	1372	3.95	
6	26320	417	1.58	37970	755	1.99	51212	1011	1.97	58487	1642	2.81	53281	2673	5.02	40696	2540	6.24	27177	1141	4.20	
7	19649	88	0.45	28548	197	0.69	38665	348	0.90	43769	454	1.04	39575	666	1.68	29687	962	3.24	20138	827	4.11	Born before 18/07/88
8	13805	24	0.17	20176	39	0.19	27348	94	0.34	30730	180	0.59	27746	204	0.74	21054	246	1.17	14149	308	2.18	
9	8827	5	0.06	12983	10	0.08	18092	26	0.14	20071	56	0.28	18099	79	0.44	14059	73	0.52	9445	94	1.00	
10	5227	1	0.02	7538	4	0.05	10786	8	0.07	11896	10	0.08	10694	39	0.36	8286	48	0.58	5658	36	0.64	Born before 18/07/88
11	2896	3	0.10	4156	2	0.05	5884	2	0.03	6425	2	0.03	5993	10	0.17	4541	16	0.35	3021	12	0.40	
12	2234	0	0.00	3146	2	0.06	4400	2	0.05	5325	5	0.09	4779	3	0.06	3675	4	0.11	2268	12	0.53	

\* Herds with cases accumulated by 1 April 1996

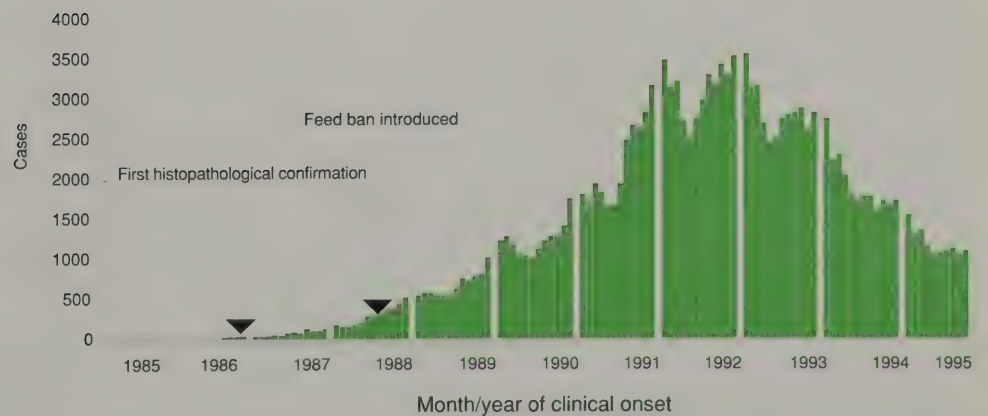
† Partly influenced by feed ban



**Figure 1.1** Four week rolling mean of restricted and confirmed cases of BSE (number of cases)

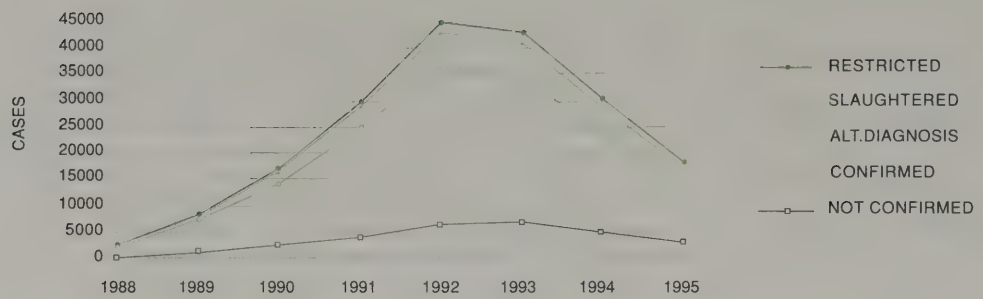


**Figure 1.2** Rolling mean of BSE suspects placed under restriction, by calving season

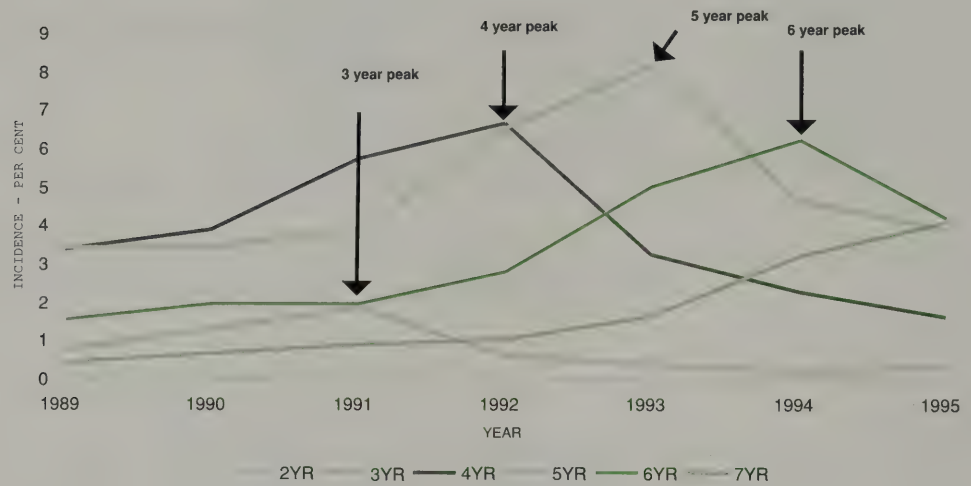


**Figure 1.3** Number of confirmed cases of BSE by month and year of clinical onset (to 31 October 1995)

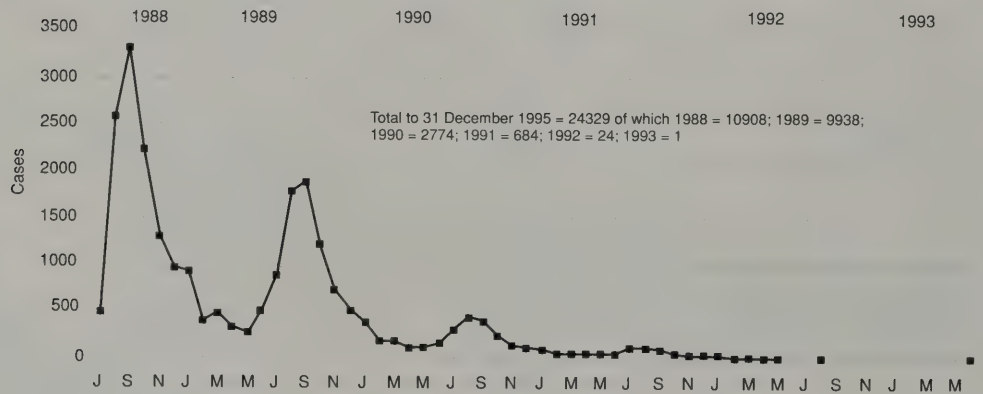




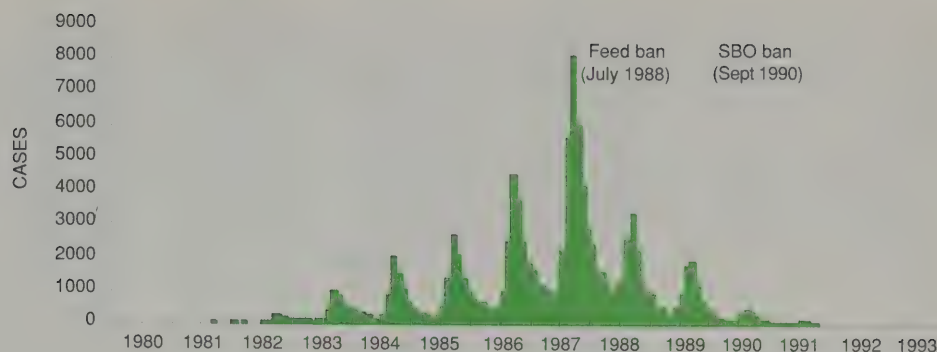
**Figure 1.4** Summary of cases placed under restriction by calendar year from 21 June 1988



**Figure 1.5** Change in age – specific incidence (per cent) of BSE from 1989 to 1995



**Figure 1.6** Number of BSE cases born after 18 July 1988 by month of birth



**Figure 1.7** *Number of cases of BSE by month of birth*

### *Distribution of cases*

By the end of the year, bovine spongiform encephalopathy (BSE) had been confirmed in 156,262 animals on 33,048 farms. Table 1.5 provides details of herd incidence by county.

The proportion of dairy herds with at least one confirmed case of BSE during the epidemic rose to 59%. The increase was partly due to a change in the source data used as denominator in the calculation. Previous calculations used agricultural census data for 1987, but 1992 is now considered to be a more appropriate and representative mid-point. In beef suckler herds the incidence rose to 15.1%, but almost 85% of the affected suckler herds had cases only in cattle purchased from, and most probably infected in, dairy herds.

### *Suspect BSE cases born after 18 July 1988*

The number of confirmed cases born after the date of the ruminant feed ban (BABs) rose to 24,329. These are plotted according to month of birth in Figure 1.6, which also subdivides the total by year, rather than month, of birth. A similar presentation of all confirmed cases with known dates of birth in Figure 1.7 puts the data for BABs into perspective.

Epidemiological investigations have continued to attempt to identify the source of infection for such cases. Neither epidemiological nor experimental evidence supports the hypothesis that the cases are a consequence of vertical and/or horizontal transmission. The report for 1994 identified cross contamination of ruminant feed in mills also producing pig and poultry rations, as the most likely source of infection. Further evidence of the extension of the feed contamination problem beyond 1991 came in the form of confirmation of disease in 24 BABs born in 1992, and one born in 1993. Although feed ingredients were traced where possible, none revealed evidence of deliberate inclusion of ruminant protein. Most of the cases were in herds in which previous cases had been confirmed, but calving patterns did not indicate a role for horizontal transmission. Similarly, in most cases the dams were still alive, or had been culled at six years of age or older, and consequently maternal transmission is unlikely to have played a significant role, if any, in infecting their offspring.

Unfortunately, investigations during 1995 identified some deficiencies in compliance with the Bovine Offals (Prohibition) Regulations 1991 (as amended). While this presented no risk to humans, it did mean that specified bovine offals were being disposed of through the animal feed chain, rather than by total destruction. This would have extended the period of risk to ruminants because infectivity, presumed to be present in some of the specified offals, would have entered some feed mills in meat and bone meal intended for legitimate use in pig and poultry rations.

Table 1.5 Distribution and incidence of herds affected with BSE by county

County	Total Confirmed Herds 31.12.95	Total Herds at Risk	Total Herd Incidence % 31.12.95	Confirmed Dairy Herds 31.12.95	Dairy Herds at Risk	Dairy Herd Incidence % 31.12.95
Cleveland	62	168	36.90	47	74	63.51
Cumbria	1577	5,000	31.54	1006	2,250	44.71
Durham	306	1,255	24.38	139	334	41.62
Tyne & Wear	16	101	15.84	10	28	35.71
Northumberland	418	1,356	30.83	95	180	52.78
S. Yorkshire	161	538	29.93	112	210	53.33
N. Yorkshire	1664	4,198	39.64	1145	1,848	61.96
W. Yorkshire	290	1,391	20.85	192	483	39.75
Humberside	244	764	31.94	117	197	59.39
Cheshire	1245	2,285	54.49	1075	1,604	67.02
Derby	769	2,205	34.88	572	1,077	53.11
Hereford & Worcester	680	2,376	28.62	418	733	57.03
Lancashire	1225	2,630	46.58	1017	1,613	63.05
Leicester	520	1,235	42.11	363	543	66.85
Merseyside	28	87	32.18	21	41	51.22
Nottingham	166	530	31.32	113	192	58.85
Shropshire	1030	2,659	38.74	730	1,275	57.25
Stafford	1002	2,724	36.78	804	1,547	51.97
Warwick	326	895	36.42	212	331	64.05
Greater Manchester	68	596	11.41	53	249	21.29
W. Midlands	34	161	21.12	23	54	42.59
Bedford	69	201	43.33	41	58	70.69
Cambridge	97	372	26.08	28	58	48.28
Essex	136	462	29.44	86	137	62.77
Hertford	122	285	42.81	72	89	80.90
Lincoln	236	1,009	23.39	127	220	57.73
Norfolk	412	1,031	39.96	206	289	71.28
Northampton	235	601	39.10	135	182	74.18
Suffolk	259	581	44.58	137	182	75.27
Berkshire	113	274	41.24	74	93	79.57
Buckingham	270	663	40.72	157	217	72.35
Hampshire	508	661	52.86	330	355	92.96
Isle of Wight	89	215	41.40	66	100	66.00
Kent	278	785	35.41	168	213	78.87
Greater London	16	76	21.05	12	29	41.38
Oxford	316	707	44.70	207	268	77.24
Surrey	180	454	39.65	106	150	70.67
Sussex East	303	727	41.68	187	249	75.10
Sussex West	345	592	58.28	227	234	97.01
Cornwall/Scilly Isles	1810	3,927	46.09	1140	1,710	66.67
Devon	2675	6,256	42.76	1928	2,829	68.15
Dorset	1061	1,625	65.29	838	984	85.16
Gloucester	606	1,394	43.47	415	619	67.04
Avon	471	931	50.59	358	513	69.79
Somerset	1737	2,962	58.64	1316	1,618	81.33
Wiltshire	980	1,419	69.06	746	821	90.86
Clwyd	708	2,136	33.15	484	989	48.94
Dyfed	2260	6,828	33.10	1581	3,231	48.93
Powys	973	3,446	28.24	257	553	46.47
M. Glamorgan	77	460	16.74	34	90	37.78
S. Glamorgan	78	241	32.37	61	110	55.45
W. Glamorgan	54	425	12.71	28	364	53.57
Gwent	295	1,086	27.16	195	364	53.57
Gwynedd	403	2,428	16.60	145	571	25.39
Western Isles	1	383	0.26	0	28	0.00
Shetland	6	241	2.49	3	24	12.50
Orkney	54	860	6.28	13	66	19.70
Highland	160	2,038	7.85	21	90	23.33
Grampian	526	2,398	21.93	122	285	42.81
Tayside	236	920	25.65	27	81	33.33
Fife	116	369	31.44	36	82	43.90
Lothian	83	327	25.38	35	80	40.35
Borders	220	819	26.86	23	57	40.35
Central	82	489	16.77	32	92	34.78
Strathclyde	776	3,722	20.85	437	1,334	32.76
Dumfries & Galloway	798	2,328	34.28	388	788	49.24



With the knowledge that 1g of infected bovine brain could potentially infect cattle by the oral route (see research below), the controls on removal and disposal of specified bovine offals were tightened further during 1995 (see below). In part, these changes, by preventing removal of the brain from the skull, eliminated the risk of brain material contaminating skull bones sent for rendering into meat and bone meal. Policing of the new statutory controls will have been enhanced by the establishment of the National Meat Hygiene Service (MHS) on 1 April 1995.

#### *Surveillance of ruminant rations*

Feed samples continued to be collected on farm for testing by ELISA for the presence of ruminant protein. Because cross reactions with some vegetable proteins were identified, sampling was suspended while further validation of the test took place. By the end of 1995 a total of 652 feed samples randomly collected on farms during the year had been tested with negative results. Subsequently, arrangements were put in place to comply with Commission Decision 95/287/EC. This stated that “official ELISA tests for the identification of ruminant protein in feed intended for ruminants shall be carried out for routine monitoring, in particular in plants which produce feed for pigs and/or poultry as well as for ruminants”.

That surveillance is due to begin early in 1996 following a period of data gathering from feed companies to determine whether or not they fell within the category of mills that require sampling.

During the year, it also became clear that other potential points of cross-contamination are of concern, ie transit from mill to farm, and on farms where pigs and poultry are also kept. The former is due to the use of vehicles that carry several consignments of feed simultaneously to several destinations. Both concerns are to be addressed through the issue of clearer information on risks, and possibly codes of practice for hauliers. Where necessary these will be supplemented by spot checks and testing by ELISA.

#### *Disposal of specified bovine offals*

Responsibility at most slaughterhouses for enforcement of the regulations concerning specified bovine offals (SBOs) passed from Local Authorities to the MHS on 1 April 1995 . This provided the opportunity for officers of the MHS and the State Veterinary Service (SVS) to undertake an extensive period of national surveillance on the handling and disposal of SBOs. Unfortunately, this surveillance revealed evidence that some SBOs may have been entering the animal feed chain by becoming mixed with other animal by-products. Very occasionally, evidence was also found of small fragments of spinal cord in dressed carcasses. A number of initiatives were undertaken in response to this evidence.

First, the rules on SBO contained in the Bovine Offal (Prohibition) Regulations 1991 (as amended) and the Bovine Spongiform Encephalopathy Order 1991 (as amended) were revoked and replaced with a new Order, the Specified Bovine Offal Order 1995. This Order consolidated, simplified and strengthened the rules on SBOs. Most notably, it carried forward the requirement introduced on 1 April 1995, that SBOs be stained with a unique blue coloured stain (Patent Blue V). The Order also required all premises disposing of SBO to be approved by Agriculture Departments. In addition it prohibited the removal of brains and eyes from bovine skulls at any premises, and the removal of spinal cords from vertebral columns at premises other than a slaughterhouse. Head boning plants must now be approved before they can process bovine heads, and the part of the skull containing the brain must be disposed of as SBO. The previous system of

movement permits for SBOs, which was shown to be ineffective, has been replaced by mandatory record keeping based on weights of SBOs.

Second, extensive exercises were undertaken in order to ensure that all sectors of the industry understand the new requirements on SBOs and the reasons why they have been introduced.

Third, all premises at which SBOs are handled or disposed of now receive unannounced surveillance visits by SVS staff. Deficiencies are immediately reported to the appropriate enforcement authority for further action. In addition, the results of every visit are collated and compared month by month. This comparison has shown a rapid resolution of the problems identified at the start of the enhanced surveillance programme.

Finally, and in response to the occasional detection of fragments of spinal cord in dressed carcasses, the Specified Bovine Offal Order was amended on 15 December 1995. This amendment, recommended by the Spongiform Encephalopathy Advisory Committee, prohibited the use of bovine vertebrae (other than coccygeal vertebrae) in the preparation of mechanically recovered meat or other foodstuffs other than fat or gelatin. The MHS also enhanced their procedures in order to ensure that carcasses do not receive a health mark until all of the vertebral column has been verified as being free of spinal cord.

#### *Rendering plants*

All rendering plants in Great Britain which process material of ruminant origin have been validated in accordance with Decision 94/382/EC. This sets new time/temperature parameters for the processing of ruminant by-products, the aim being to minimise the possibility that spongiform encephalopathy agents may survive the rendering process. Officers of the SVS make quarterly visits to all rendering premises and a component of these visits is now a check to ensure that validated plants continue to meet the requirements of the Decision.

#### *International negotiations*

At the end of 1994, the need to provide declarations of freedom from BSE prior to slaughter and export of meat, had been discontinued for cattle born after 1 January 1992. Following confirmation of cases in cattle born in 1992, this rule was revised in Commission Decision 95/287/EC to exempt only cattle under 30 months of age at slaughter. No change was recommended when the "1993 born" case was confirmed, this having been 25 months of age at clinical onset. Nevertheless, by the end of 1995, there was still only one case out of 56 confirmed cases, that was under 30 months of age at clinical onset. Further changes introduced in the Decision required specified lymph nodes to be removed during the deboning process, where boned out carcase meat was to be exported from cattle over two and a half years old which had, at any time, been on a holding on which a case of BSE had been confirmed in the preceding six years.

#### *Feline spongiform encephalopathy (FSE) and other exotic spongiform encephalopathy (SEs)*

The report rate in domestic felines declined during 1995 to eight confirmed cases, compared with 16 in 1994. Two pumas (one female and one male, aged 11 and 15 years respectively), residing at the same wildlife park were also confirmed to have a spongiform encephalopathy. Only the female was clinically affected, but her partner was also euthanased. A domestic cat in the same ownership was also found to have FSE. All had access to split bovine heads in the past.

Two ankole cows are included in the list of exotic species at Table 1.6 simply because they were exotic and presented at wildlife parks. They were slaughtered in 1991 and 1995 as normal BSE suspects, as if reported on



farm. It is felt appropriate that they now be reported separately as they do not represent domestic breeds normally found on British farms.

*Table 1.6 – Spongiform encephalopathy in exotic species, 1985-1995*

Nyala	1
Gemsbok	1
Oryx (Arabian and scimitar horned)	2
Kudu	6
Eland	6
Puma	3
Cheetah*	4
Ocelot	1
Ankole cow	2
Domestic cat	69

\* One confirmed in Australia, another in the Republic of Ireland, but both exported from Great Britain.

### *Research and development (VLA Weybridge) Epidemiological studies*

The epidemiological research on BSE continued to concentrate on specific studies and analyses of the data arising from the detailed monitoring to identify any unexpected events, and specifically to determine the risks of transmission of BSE by a means other than from a feed borne source. As indicated in the preceding sections, the expected reduction in the incidence continued during the year. This was due to the sustained reduction in animals less than six years of age and the additional reduction in incidence in six year old animals during 1995.

The confirmed cases of BSE in animals born after 18 July 1988, when the ruminant feed ban was introduced, attracted most investigative attention. Both an age-period-cohort modelling approach and an analysis of standardised morbidity ratios were used to assess the change in risk of infection for animals born in successive years since the ruminant feed ban. The results of both methods indicated that this ban resulted in an immediate reduction in risk of infection for animals born in the last four months of 1988. This was incomplete, but the risk of infection so declined in successive years that the risk of infection for animals born in December 1990 was 10% of that for animals born in December 1987. The number of cases of BSE in animals born after 1990 were too few to assess the change in risk of infection for animals born subsequently.

Previous studies and ongoing analyses have failed to reveal any evidence that horizontal or maternal transmission could account for this continued (although much reduced) exposure. The possibility of accidental contamination of cattle feedstuffs with ruminant protein was therefore examined. An examination of the regional distribution of animals born in 12 month periods before and after the ban revealed a change in the proportional distribution of homebred cases born after the feed ban. The most notable changes were increases in the proportion of such cases in the eastern and northern regions of England. As the national pig and poultry populations are concentrated in these regions, and there was therefore a greater probability of feed mills in these areas producing feedstuffs for both ruminant and monogastric animals, further analyses were undertaken. These examined the association between the incidence of BSE in animals born after 30 October 1988 and the ratio of the population of adult cattle to the pig population and the poultry population in each county in England and Wales. A highly significant correlation was found. This ecological correlation cannot be taken as conclusive evidence of a causal association. It is, however, consistent with a continued but reducing exposure from the feed borne source as a result of accidental contamination of cattle feedstuffs with ruminant protein. As a result, the additional control measures indicated in the previous section have been put in place to prevent further exposure from this source.



The long term cohort study designed to investigate the risk of maternal transmission, mentioned in previous reports, continued as planned. The last animals in this study will be slaughtered during 1996 and it will not be until the brains of these animals have been examined histologically and the data analysed that the results can be reported. However, the accumulated evidence continues to indicate that neither maternal nor horizontal transmission has occurred to sustain the disease in the British cattle population.

*Feline spongiform  
encephalopathy (FSE)*

An initial analysis of the descriptive epidemiological features of FSE in Great Britain was completed during the year. This involved the first 54 cases for which complete basic epidemiological data had been collected. The cases were distributed widely throughout Great Britain. Although there was a regional variation in the observed incidence this was consistent with a geographical variation in the ascertainment of cases because of local interest. There has been an apparent excess incidence in male cats, which could not be simply explained. In examining the possible sources and routes of infection, a feed borne source was most likely.

*Urinary metabolites and  
serum proteins in BSE*

Electrochemical analysis of bovine urine by single electrode cyclic voltammetry had indicated that the relative concentrations of three groups of metabolites in the urine of clinically suspect cattle showed a correlation with the subsequent histopathological diagnosis of BSE. The instrumentation for this, although effective as a research tool, proved to be unsuitable for the determination of the actual compounds involved and for the routine analysis of large numbers of urine samples. Alternative analytical strategies were assessed and a new system involving a 16 – electrode array detector was purchased. The methodology required for the separation and quantification of the individual electrochemically-active urinary metabolites has been developed. The system is currently undergoing blind trials on urine samples from clinically affected and normal animals to determine the specificity and selectivity of the technique.

A number of serum proteins are being assessed as potential diagnostic aids in BSE. Levels of the brain isoform of creatine phosphokinase remain within the normal range in BSE, as do concentrations of the G4 isoform of acetyl cholinesterase. An ELISA for Neurone Specific Enolase has been developed and early indications are that NSE levels rise in BSE as they have been reported to do in cases of Creutzfeld-Jakob disease.

*Antibodies to abnormal  
PrP*

Highly purified bovine abnormal PrP has been isolated from the brains of affected cattle and used to prepare novel immunogens for the production of polyclonal antisera. Assessment of the immunogens in a series of ELISAs using a range of antibodies previously raised to different Scrapie associated fibril(SAF) preparations and PrP-peptides have confirmed and quantified the products. Animals have recently been immunised and a number of first boost antisera have been taken.

*Cellular pathology of the  
transmissible spongiform  
encephalopathies*

It is well-documented from ultrastructural examination of the spongiform changes in experimental models of the transmissible spongiform encephalopathies (TSE) that vacuoles arise mainly within dendrites, with smaller numbers occurring in other neuronal structures, oligodendroglial inner tongue, myelin sheaths and astrocytes. However, the causation, structural origin and mechanism(s) of formation of spongiform lesions in the TSEs remain unclear. A study was made of the ultrastructural changes in the brains of eight naturally-affected cases of bovine spongiform encephalopathy and three clinically normal cows, which were optimally fixed by carotid perfusion. In addition to well-defined vacuoles, numerous dense,

pleiomorphic, multi-lamellated membranous structures were observed in the perikarya, dendrites and synaptic boutons of many neurones in a number of different neuroanatomical locations. They were almost always associated with vacuolation or cytoplasmic rarefaction in dendrites, but were also observed in the absence of any other cytoplasmic abnormality in neuronal perikarya. It is proposed that these dense structures are lysosomally derived, and that they give rise to intraneuronal vacuolation by the inappropriate release of lysosomal enzymes, leading to localized vacuolation which gradually encroaches indiscriminately on adjacent structures. These findings therefore suggest that in natural BSE many neuronal vacuoles are lysosomal in origin.

#### *Studies on the pathogenesis of BSE*

The study to experimentally reproduce BSE in cattle by oral exposure to a single large dose of BSE-affected brain homogenate has been continuing. Clinical signs of BSE were first noted 35-37 months post inoculation (p.i.). Light microscopic vacuolar changes in the brain of cattle were first detected 32-36 months p.i.. The last experimental group of cattle was killed at 40 months p.i.. There is, therefore, an apparently closer temporal association between the development of overt clinical signs and diagnostically significant vacuolar changes in the brains of affected cattle, than might have been anticipated from previous studies of scrapie-like diseases in rodent models.

The mouse bioassays of tissues, results of which are at present completed only from challenged cattle killed up to 18 months p.i., have shown infectivity at increasing titres from six months p.i. confined exclusively to the distal ileum. Evidence of replication in this tissue is consistent with previously observed pathogenetic events in natural scrapie in sheep and in experimental scrapie in rodents when infection is by non-neural peripheral routes.

#### *Transmission studies*

Tissues from the previously reported transmission of BSE to pigs by the simultaneous intracerebral (i.c.), intravenous (i.v.) and intraperitoneal (i.p.) inoculation with pooled brain stem homogenate from BSE-affected cattle are being assayed in mice. Although this study is incomplete, evidence of transmission has been obtained from the brain, jejunum and distal ileum of the affected pigs killed 17 and 32-37 months p.i..

Studies in which pigs were challenged orally with BSE-affected or scrapie-affected brain have continued, with no evidence of transmission from either at 67 months p.i. and 25 months p.i. respectively.

Studies to examine the transmissibility of BSE to the domestic fowl when challenged orally or parenterally with BSE-affected brain have been completed and have shown no evidence of transmission of a scrapie-like disease. Nervous tissues harvested from these birds are to be subpassaged into mice and domestic fowl to further investigate the possibility of transmission of BSE to an avian species.

Cattle challenged oronasally with foetal membranes from BSE-affected cows are now in the sixth year of study and show no clinical evidence of a BSE-like disease.

The study to compare the efficiency of the bioassay of BSE infectivity in cattle and mice, and to obtain a measure of the potential underestimation of the infectivity titre of BSE tissues when titrated across a species barrier to mice, also remains in progress. The titration of infectivity in mice has now



been completed and revealed a titre of infectivity of 103.3 mouse ID50 units/g of tissue when measured by combined i.c. and i.p. injection of RIII mice. The parallel titration of infectivity in cattle is continuing and cattle are now 35 months p.i. BSE has been confirmed in cattle from experimental groups inoculated with brain stem homogenates at dilutions  $10^{-3}$ - $10^{-7}$ . Calculation of the titration end point must await completion of the study.

The study of the effect of oral inoculum dose on attack rate and incubation period of BSE in cattle (commenced in 1992, where four-month-old calves were dosed orally with either 1g, 10g, 100g or 3 x 100g (on successive days) of homogenate prepared brain stem from BSE affected cattle) is nearing completion (47 months p.i.). To date, signs of BSE have been observed in animals from all four dose-groups. Pathological confirmation of disease in all groups is as yet incomplete and full analysis of the results must await completion of the study.

#### *Embryo transfer studies*

Studies were continued to confirm that BSE is not transmitted to surrogate dams, and/or to the offspring, when embryos transferred from clinically affected cows have been subjected to the sanitary protocols of the International Embryo Transfer Society. Eight of the 347 surrogate dams used, and eleven of the 266 liveborn calves resulting from embryo transfer, have since died from various causes. Cattle dying on this project are routinely screened by brain histopathology and scrapie-associated fibril (SAF) examinations, but no evidence of BSE has been detected so far. All the remaining cattle will be kept for another three to four years (i.e. a total of seven years from the start of the project) before they too will be killed and their brains examined.

Bioassays of embryos/ova and uterine flushing fluid samples in mice (1050 mice in total) have almost all been completed, with just a few outstanding neuropathological examinations to be done. No evidence of infectivity has been detected in any of the mice that were inoculated with these materials.

#### *Clinical studies*

A proportion of cows killed as suspects under the BSE Orders are not confirmed to have the disease on histopathological examination. Another subset of cows clinically suspected of having BSE are released from restriction under the Orders, due to their recovery or clinical discrimination from BSE. Detailed and prolonged clinical studies on cows in these categories suggest that many of these cows suffer from poorly defined or uncharacterised conditions, including cerebellar degenerations, pregnancy toxæmia, and hypersensitivity to ectoparasitism, as well as syndromes which may be described as psychoses; one frequent manifestation in particular is associated with parturition.

Studies continue on abnormalities of oral behaviours in cattle with BSE. Clinical observations of cows with BSE and of sheep with scrapie have demonstrated that their time spent ruminating is consistently reduced, although eating time in most cases is maintained at normal values. In BSE, as the disease progresses, rumination time often declines from normal values of >30% to <7%, or ceases altogether. Suspect cases which have proved subsequently to be histopathologically negative have not shown the change. Furthermore, no similar observation has been made for any other neurological disease of ruminants. Neurological control of ruminants' fore-stomachs is exercised from centres in the caudal brainstem, especially in the nucleus of the solitary tract and the dorsal vagal motor nucleus around the level of the obex. As these sites are affected by histopathological vacuolar changes in BSE, there may be a functional correlation between changes in

rumination and histopathology in the disease. Measurement of oral behaviour, therefore, has potential as a diagnostic test to discriminate BSE from other bovine neurological conditions. Application of a jaw activity recorder for monitoring over a period of days is being used experimentally to measure these behaviours in BSE-suspects with a view to improving the accuracy of clinical diagnosis.

Abnormalities of heart rate and rhythm previously detected in BSE have been further studied using a cardiac monitor. Bradycardia, originally detected by auscultation, was confirmed by ambulatory monitoring of a sample of unrestrained animals. More than half of all ambulatory values from animals suffering from BSE were less than 50 beats per minute. In contrast to results for BSE affected animals, no values less than 40 beats per minute were obtained from normal animals or unconfirmed suspects. The bradycardia was paradoxical in view of the excitable and fractious behaviour of most of the animals with BSE. Although bradycardia was clearly evident, many BSE cases also displayed short bursts of tachycardia superimposed on a slow basal heart rate.

#### Selected Publications

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Taylor, D.M., Ferguson, C.E., Bostock, C.J., Dawson, M. (1995) – Absence of disease in mice receiving milk from cows with Bovine Spongiform Encephalopathy. *Veterinary Record* 136, 592

Wells, G.A.H., Sayers, A.R., Wilesmith, J.W. (1995) – Clinical and epidemiologic correlates of the neurohistology of cases of histologically unconfirmed, clinically suspect bovine spongiform encephalopathy. *Veterinary Record* 136, 211-216

Wells, G.A.H., Wilesmith, J.W. (1995) – The neuropathology and epidemiology of bovine spongiform encephalopathy. *Brain Pathology* 5, 91-103



<b>Brucellosis</b>	<b><i>Brucella abortus</i> was not isolated in Great Britain in 1995. The country remains “Officially Brucellosis-free”.</b>
<i>Incidence</i>	There were no confirmed outbreaks due to <i>Brucella abortus</i> in 1995. During the year, 25 cattle were slaughtered (24 serological reactors and 1 contact) from 25 farms following blood tests. Compensation for animals slaughtered was £12,750 and salvage received was £4,699.
<i>Monitoring</i>	<p>During the year the Central Veterinary Laboratory (CVL) tested 1.28 million blood samples (1.2 million in 1994). These samples were screened using the indirect ELISA, and positives were further tested using the Serum Agglutination Test (SAT) and Complement Fixation Test (CFT). Additionally, approximately 116,000 samples were tested prior to export, 2070 samples from imported animals were tested and 3087 samples were tested during artificial insemination work. A number of false positive reactions has again occurred this year with no indication of genuine disease such as abortions. This problem is thought to be due to <i>Yersinia enterocolitica</i>, although to date it has proved impossible to isolate the organism.</p> <p>Routine monitoring of 27,042 cattle abortions and premature calvings was carried out by Local Veterinary Inspectors and Ministry veterinary staff. All results were negative.</p> <p>Bulk milk samples continued to be tested monthly by the Genus Laboratory at Llanelli and by the three Scottish Laboratories, using the Milk Ring Test (MRT). Primary milk purchasers are required to sample each herd from which they purchase milk and to submit a monthly sample to one of the approved laboratories. A total of 60 positive and inconclusive results were reported, and Divisional Veterinary Officers undertook further milk and blood sampling in these herds. All these follow-up investigations were negative.</p>
<i>Policy review</i>	The Consultants commissioned to review the brucellosis policy in Great Britain reported in May 1995. Their recommendations were accepted in part. A recommendation to place greater reliance on milk testing to detect infection in dairy herds at an early stage, and to discontinue abortion investigations except in exceptional circumstances, is being considered. Abortions in dairy herds would remain notifiable, but investigations would be at the discretion of the Divisional Veterinary Manager.
<i>Brucellosis of sheep and goats</i>	<p><i>Brucella melitensis</i> and <i>B. ovis</i> are covered by Directive 91/68/EEC. These bacteria have never been recorded in animals in Great Britain, and Commission Decision 93/52 accorded Officially Brucellosis-free status to the United Kingdom.</p> <p>Continuing evidence of our freedom from <i>B. melitensis</i> was provided by a further structured survey of the national sheep flock and goat herd, completed during the summer. The numbers of animals tested was less than in 1994, as permitted by Commission Decision 94/953/EC. A total of 16,328 samples were collected from 1555 sheep flocks and 1502 samples from 271 goat herds. All flocks and herds were shown to be uninfected. In addition, material submitted to Veterinary Investigation Centres from cases of abortion were routinely screened for brucellosis, as were blood samples submitted for testing within the Sheep and Goat Health Scheme up until June 1995. As in previous years, no positive results were obtained.</p>

## *Research and development (CVL, Weybridge)*

A comparative trial was carried out between an ELISA developed at the CVL and the existing MRT. The CVL and the Carmarthen Veterinary Investigation Centre used the ELISA on 18,000 bulk tank milk samples which had previously been tested by MRT at the Genus laboratory. The results imply an upper (95% confidence) limit of 0.35 ELISA positive milk samples per 1,000 milks tested which is less than half the current false positive rate of the MRT. The ELISA also proved to be more sensitive than the MRT, and this could be of value in detecting low levels of infection in large herds.

The pathogenicity of novel strains of *Brucella* isolated from marine mammals was assessed by their ability to cause abortion and seroconversion in challenged sheep. The majority of both pregnant and non-pregnant animals showed seroconversion at some stage following inoculation, but *Brucella* was recovered from only one aborting ewe. Transmission to uninfected sheep placed in contact was not demonstrated.

Research continued into the humoral and cellular immune response of cattle with brucellosis and those infected with cross-reacting *Yersinia enterocolitica* O9. A strong cross-reaction has been demonstrated in all standard serological methods. However, through the study of the cell mediated response, significant progress has been made in the development of methods to distinguish between cattle infected with *B. abortus* and those infected with *Yersinia*.

An in vitro assay for gamma-interferon production was assessed. In some cases it was as successful as standard serological tests in the early detection of *Brucella* infection.

## **Diseases of horses**

### *Investigations of suspect disease*

Four investigations for suspect glanders were carried out during the year on animals which had given a positive complement fixation test result on a blood sample collected for export purposes. In each case, restrictions were removed after investigation.

### *Equine viral arteritis (EVA)*

After many months of consultation with the British equine industry, the Equine Viral Arteritis Order 1995 was implemented with effect from 1 August 1995. The Order imposes the lowest level of intrusion into business commensurate with disease control. The official controls have received widespread support from the British equine industry.

The Order makes the suspicion of EVA notifiable in stallions, and in mares that have been served, by either natural mating or by artificial insemination, by the suspect stallion within the previous 14 days. The identity of suspected stallions may be published, and restrictions are placed on the use of infected stallions and on the collection and use of semen for the duration of the infection. Suspected or infected stallions or semen may be used under licence on EVA immune mares, provided the owner of the mare is made aware of the EVA status of the stallion. The stallion is allowed free movement from its home premises for competition and amenity events, but a change of ownership of the stallion is only allowed under a licence issued by the Divisional Veterinary Manager (DVM). EVA seropositive stallions which are known to have been seronegative prior to vaccination need not be reported to the DVM.



By the end of 1995, suspicion of disease had been reported in 13 stallions of four breeds – all non- thoroughbreds. One stallion has been released from restrictions; one was castrated; three have deferred veterinary enquiry (owner's option) but remain under Form A restrictions. Investigations continue into the status of the remaining eight stallions.

#### *Research and development*

Work continued on diagnosis and strain differentiation of EVA, and on possible insect vectors for arboviruses such as African horse sickness.

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Westcott, D.; Lucas, M.; Paton, D. (1995)– Equine arteritis virus: genetic analysis of strain variation.

Schwyzer, M.; Ackermann, M.; Bertonni, G.; Kocherhans, R.; McCullough, K.; Engels, M.; Wittek, R.; Zanoni, R., editors– Immunobiology of Viral Infections: Proceedings of 3rd Congress of European Society for Veterinary Virology; 1994; Interlaken, Switzerland. Lyon, France: Fondation Marcel Mérieux: 479-483

#### **Enzootic bovine leukosis**

**Enzootic bovine leukosis (EBL) is very uncommon in Great Britain. During 1995, infection was confirmed in seven animals in seven herds.**

A national testing programme for EBL, which began in 1992, completed its third full year of operation. All blood samples collected for routine testing for brucellosis are also tested for EBL. All dairy herds are tested every three months, by sampling the milk produced. When a herd gives a positive result, all animals in the herd are blood sampled. Movements of cattle are prohibited out of herds in which infection is confirmed, other than movements direct for slaughter. Of the seven infected herds revealed in 1995 by this programme, six were dairy herds and one a beef suckler herd. None of the seven infected animals showed any evidence of leukotic changes at autopsy.

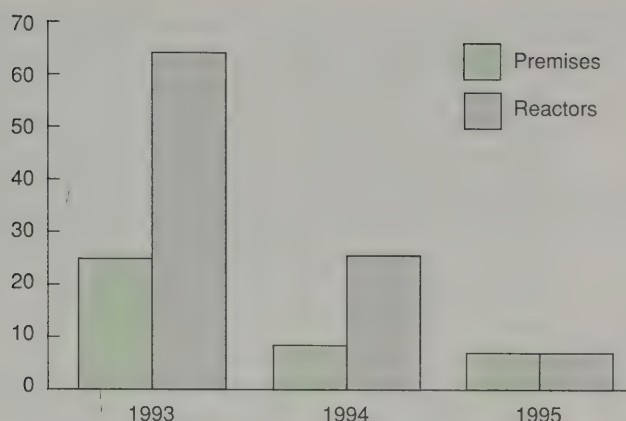
Besides the animals in infected herds revealed by the above programme, 17 suspected clinical cases were investigated during the year and found to be negative. One hundred and twenty tumour samples were submitted from abattoirs or knackers' yards, and although 26 were diagnosed by histopathological examination as lymphosarcoma, tracing did not reveal any evidence of EBL in the herds of origin.

Six hundred and thirty-seven (637) imported animals were tested for EBL under the Animals (Post-Import Control) Order 1993. All were negative except for one heifer imported from Canada.

Routine testing for EBL at Artificial Insemination (AI) Centres did not reveal any reactors.

#### *Research and development (VLA Weybridge)*

The application of the polymerase chain reaction to the diagnosis of EBL from suspect tumour material was investigated. The assay directly detects bovine leukosis virus by amplification of part of the provirus envelope (env) gene from genomic DNA. Samples of tumours detected at meat inspection or at autopsy were examined, as well as normal lymph nodes. The work is scheduled for completion by mid 1996.



**Figure 1.8** Number of EBL cases and number of premises affected

## Exotic diseases

### *Contagious agalactia of sheep and goats*

### *Research and development (VLA Weybridge)*

### *Contagious bovine pleuropneumonia (CBPP)*

### *Investigations of suspected CBPP*

## Contagious agalactia has never been recorded in Great Britain.

Great Britain has submitted a request for recognition of freedom from contagious agalactia to the European Commission. In order to further strengthen our claim of disease freedom, all samples taken during the 1995 survey for *Brucella melitensis* were also tested for *Mycoplasma agalactiae*. Goat samples were also tested for *M. capricolum* and *M. mycoides* var *mycoides*. Sampling was at double the rate of the 1994 survey, and involved 44,323 samples from 2595 premises. All the results were negative.

Research has progressed with the development of improved diagnostic tests for contagious agalactia. The primary cause of the disease is *Mycoplasma agalactiae*, but *M. mycoides* subsp. *mycoides* large colony (LC) variant, *M. capricolum* subsp. *capricolum*, and *M. putrefaciens* have also been isolated from sheep and goats with arthritis and mastitis. Immunoblotting tests have been introduced for these mycoplasmas and can be used to provide validation of suspect results to the complement fixation test. Mycoplasma proteins are separated, transferred to membranes and reacted with serum. Specific patterns are produced. Analysis of *M. agalactiae* by immunoblotting has shown considerable heterogeneity amongst strains, but the patterns differed from those of *M. c. capricolum* and *M. m. mycoides* LC strains which showed many shared bands.

Work has started on the evaluation of a polymerase chain reaction for members of the Mycoides cluster which includes *M. c. capricolum*, *M. m. mycoides* LC and two caprine respiratory pathogens: *M. c. capripneumoniae* and *M. m. capri*. Primers have been synthesised which amplify DNA from all members of this cluster but not from any other mycoplasma or bacteria.

## Great Britain has remained free of CBPP since it was eradicated at the end of the nineteenth century.

Suspected CBPP was reported and investigated on three occasions in 1995, when lung lesions similar in appearance to those of CBPP were found at routine post mortem examinations of cattle at Veterinary Investigation Centres. In each case, the possibility of CBPP was eliminated. In all cases, the lesions were attributed to *Pasteurella pneumoniae*.



*Research and development  
(VLA Weybridge)*

Research on contagious bovine pleuropneumonia (CBPP) has continued with the evaluation of monoclonal antibodies, prepared against the causative organism *M. mycoides* subsp. *mycoides* small colony (SC) variant, for the detection of specific antigen in formalin fixed tissue sections of affected animals. Such a test will be valuable following the sudden death of an animal with acute respiratory disease and where lung pathology is suggestive of CBPP. Three monoclonal antibodies were identified, which gave intense staining of lung tissue from a CBPP affected cow and gave no staining of lung tissues from unaffected animals or those affected by other bacterial or viral respiratory pathogens.

*Foot and mouth disease*

**Great Britain remained free from foot and mouth disease (FMD) during 1995. The last outbreak occurred in 1981.**

During the year the possibility of FMD was reported and investigated on 18 occasions. In the majority of the cases (13), veterinary practitioners had requested consultation visits by whole time veterinary officers of the Ministry. Such consultation visits are made when the practitioner does not consider that there are sufficient grounds for reporting suspected disease, but requires a second opinion. All the consultations were found to be negative on clinical grounds. On three other occasions the possibility of FMD was reported by staff at Veterinary Investigation Centres (VICs) in the course of routine disease investigations. On another occasion the possibility of FMD was reported by the owner of the animals concerned, and on the last occasion, disease was suspected at a slaughterhouse. All these reports were investigated immediately by whole time veterinary officers and in all but one of the cases the possibility of FMD was eliminated by clinical examination. Following one of the VIC reports (see below), it was necessary to impose movement restrictions and submit samples to the Institute for Animal Health (IAH) laboratory at Pirbright for testing for FMD. The laboratory tests were negative and restrictions were lifted within 24 hours.

The diagnoses made in the course of these consultations and investigations included:

- Mucosal disease of cattle.
- Trauma to the mouth and tongue of cattle caused by access to caustic soda treated feed.
- Infectious bovine rhinotracheitis in cattle.
- Orf in sheep.
- Trauma to the mouth caused by drenching sheep.
- Trauma to the legs and snout of pigs caused by exposure to new concrete, irritant chemicals or other abrasions.

The single investigation which necessitated the submission of samples for laboratory testing by IAH Pirbright, followed a VIC report of a lesion with the appearance of a recently ruptured vesicle on the snout of a pig presented for routine post-mortem examination. Investigation at the farm of origin disclosed a history of recently purchased pigs in the contact group, with several pigs showing abnormalities of gait. The possibility of FMD could not be ruled out on the initial investigation: however, laboratory tests and a follow up examination of the animals on the farm of origin eliminated the possibility of FMD. The snout lesion was attributed to trauma and other symptoms of ataxia to dehydration, a consequence of the unusually hot weather at the time.

### *Rinderpest*

**Rinderpest was eradicated from Great Britain at the end of the last century and has not occurred since then.**

No suspected cases of rinderpest were reported.

### *Swine fever*

**Great Britain remained free from classical swine fever (CSF) during 1995. The last outbreak occurred in 1987. African swine fever (ASF) has never been recorded in Britain.**

### *Investigations of suspected swine fever*

Suspected swine fever was investigated on ten occasions. All followed reports from Veterinary Investigation Centres (VICs) carrying out routine post mortem examinations of pigs. In all cases swine fever was ruled out.

The diagnoses made in the course of these investigations included:

- *Salmonella cholerae suis* septicaemia.
- Streptococcal septicaemia.
- Erysipelas.
- Other bacterial infections aggravated by concurrent respiratory virus infections.
- Thrombocytopaenic purpura.

### *Swine fever - Research and development (CVL, Weybridge)*

The nucleotide sequence was determined for a region of the E2 gene from 130 isolates of CSF virus from around the world. Using this data, two major groups and five subgroups of the virus were distinguished. It appears that three of these subgroups are currently present in Europe. A detailed study of a series of related Sardinian CSF viruses showed that changes of only a few bases in the E2 region can be used to demonstrate epidemiological relationships between the strains. This is an important finding as differences seen between European isolates are generally small.

Major improvements have been made in the techniques for preparing samples for molecular sequencing. By using rapid RNA preparation techniques in conjunction with a polymerase chain reaction, sequence data from new isolates can be obtained within three days compared with the earlier methods which involved virus isolation and required several weeks. The improved techniques have the additional advantage that the risk of cross contamination is much reduced.



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### *Swine vesicular disease*

**Great Britain remained free from swine vesicular disease (SVD) during 1995. The last outbreak occurred in 1982.**

### **Infectious diseases of poultry**

**Newcastle disease has not been confirmed in Great Britain since July 1984. The last case of avian influenza was confirmed in January 1992. Twenty six cases of paramyxovirus infection of pigeons were confirmed in 1995.**

Twenty cases of suspect disease (Newcastle disease or avian influenza) were investigated. All were negative, two after the initial clinical examination by a Ministry Veterinary Officer and the remainder after examination of material at the Central Veterinary Laboratory.

### *Avian influenza*

On one occasion avian influenza virus (strain H4) was isolated from a Muscovy Duck. The virus had a pathogenicity index below the EC criteria for confirmation of a disease outbreak.

### *Newcastle disease*

The national flock is protected against Newcastle disease by the voluntary use of inactivated and live attenuated vaccines which comply with the criteria laid down in Commission Decision 93/152/EEC. On three occasions a Newcastle disease virus was isolated by the Central Veterinary Laboratory but was of low pathogenicity and most likely a vaccine strain of the virus.

### *Paramyxovirus of pigeons*

The disease remained notifiable under the Infectious Diseases of Poultry Order 1986. Twenty six cases were confirmed in 1995 compared with 36 cases in 1994.

### *Research and Development (VLA Weybridge):*

### *Avian influenza*

High pathogenicity for chickens is not usually associated with avian influenza virus of H10 subtype. However, two H10 viruses held in the virus repository of the International Reference Laboratory were sufficiently

virulent to fulfil the criteria in in vivo tests of viruses for which control measures should be taken in the European Community. One of these was isolated in 1979 from turkeys in England; the other from quarantined birds in Singapore in 1993. Studies were undertaken to determine if the mechanisms of pathogenicity were the same for H10 viruses as for “conventional” highly pathogenic viruses of H5 or H7 subtype. Results suggest that different mechanisms were responsible for producing disease. Unlike H5 and H7 highly pathogenic avian influenza viruses, the H10 viruses did not possess multiple basic amino acids at the cleavage site of the haemagglutinin and did not replicate to high levels in the brains of infected chickens. Field experience suggests that these viruses are also not as pathogenic as the viruses of H5 or H7 serotypes.

### *Newcastle disease*

Phylogenetic relationships determined by the analysis of a short genetic sequence across the signal region of the FO gene of isolates of Newcastle disease virus are very similar to those based on the entire FO gene sequence. Numerous isolates obtained over the last 20 years from many different countries have been examined using this short sequence. Several genetic lineages have been observed which show temporal and geographical relationships, as well as showing the relationships of viruses responsible for panzootics. One distinct lineage consisted of viruses isolated from cormorants and turkeys in the USA and Canada.

The continued use of a panel of monoclonal antibodies to characterise viruses submitted to the International Reference Laboratory has enabled valuable tracing of epidemiological links or distinction between viruses isolated from various parts of the world. Additional monoclonal antibodies are being prepared to complement and replace those used currently.

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### **Rabies**

**Great Britain remained rabies free. The last cases outside quarantine occurred in 1969 and 1970; prior to these, in 1922. The last case of rabies in quarantine was in 1990.**

### *Import controls*

The Rabies (Importation of Dogs, Cats and Other Mammals) Order 1974 (as amended) covers all warm-blooded mammals except farm stock and some other herbivores which are not considered significant vectors of the disease. These exceptions can be controlled under the Order if necessary. Animals



controlled by the Order must be imported only under licence, landed at an authorised port or airport, transported by an authorised carrying agent to approved quarantine premises and detained there for six months at the owner's expense. All dogs and cats must be vaccinated against rabies on arrival.

In addition to the quarantine premises for dogs and cats (described below and in Table 1.7) approximately 159 premises are authorised for other mammals. This number varies according to the importers' needs and some are not continuously authorised. These premises include research establishments, acclimatisation centres, zoos and wildlife parks and the permanent premises of circuses.

*Table 1.7 Number of quarantine premises, carrying agents, import licences issued, illegal landings and deaths in quarantine in Great Britain during 1995*

	Dogs	Cats	Other Mammals	Total
Authorised quarantine kennels and catteries				80
Units in quarantine premises (includes 36 dual purpose dog/cat units)	2,559	1,652		4211
Authorised carrying agents for dogs, cats and other mammals				155
As portal carrying agents				21
Import licences issued	4,695	3,246	822	8,763
Total animals licenced (Dogs and Cats)	5,394	4,126		9,520
Total other mammals imported			81,054	81,054
Animals reported as illegally landed	59	44		103
Incidents involving illegal landing of other mammals				8
Deaths in quarantine	61	56	4	121

*Implementation of Directive 92/65/EEC (the “Balai” Directive)*

On 1 July 1994, the Rabies (Importation of Dogs, Cats and Other Mammals) Order 1974 was amended to implement the Balai Directive. This allows commercially traded dogs and cats from other Member States of the EC to enter the UK without quarantine provided they comply with a strict set of conditions.

Only 25 dogs and 11 cats were imported under these provisions in 1995. One dog was placed in quarantine as it did not meet the requirements of the Directive.

*Quarantine kennels and catteries*

All quarantine premises are approved by Ministry staff and inspected at least four times each year to ensure that they conform to the statutory requirements for disease control.

*Carrying agents*

All vehicles used by carrying agents are inspected and must be authorised before they can be used for the transport of quarantined animals. Following this, vehicles are inspected at least once a year and are re-authorised annually.

*Import licences*

Import licences are required for rabies-susceptible mammals (as defined in the Order) to be imported into Great Britain, except for those covered by the

Balai Directive. Table 1.7 shows the number of licences issued for importation of dogs, cats and other mammals in 1995.

*Illegal landings*

During the year 103 animals were reported as having been illegally (Table 1.7). There were 27 prosecutions for contraventions of the import regulations. Penalties imposed included fines of up to £2,500 and on one occasion a day in prison.

*Death in quarantine*

Diagnostic tests for rabies are carried out at the CVL, Weybridge on all dogs and cats dying in quarantine.

*Suspected cases of rabies*

Reports of suspect rabies were investigated on 11 occasions during 1995 involving four dogs, two cats, three foxes, one horse and one ferret.

Biting, scratching or licking of humans was reported in one of these cases.

Veterinary staff resolved four incidents at the initial clinical investigation. Two were resolved following isolation and observation for 15 days, and the remaining five following examination of material submitted to the Central Veterinary Laboratory, Weybridge.

*Surveillance*

The Rabies Unit at the CVL has been monitoring bat rabies since 1985. Bats found sick or dead in the UK have been screened for the presence of the rabies virus. This is done by direct immunofluorescent staining of whole brain impression smears, using a commercially available diagnostic reagent capable of detecting all known types of rabies and rabies-related viruses (Centocor FITC anti-rabies monoclonal globulin). During 1995, 96 samples were screened and all samples tested were negative.

*Research and development*

Research has proceeded with the development and optimisation of a rapid diagnostic method for the detection of rabies viruses in the event of an outbreak in the United Kingdom. Reverse transcription (RT) of the viral RNA is followed by amplification by the polymerase chain reaction (PCR). This "nested" RT-PCR has been developed to detect both the rabies and rabies-related viruses and is currently undergoing evaluation with representative samples of different genotypes of the *Lyssavirus* genus collected from all parts of the world. The technique has also been shown to be more sensitive than the routinely used fluorescent antibody test when samples are received in an advanced stage of decomposition. The RT-PCR methodology is now undergoing assessment as an additional test for ante-mortem diagnosis.

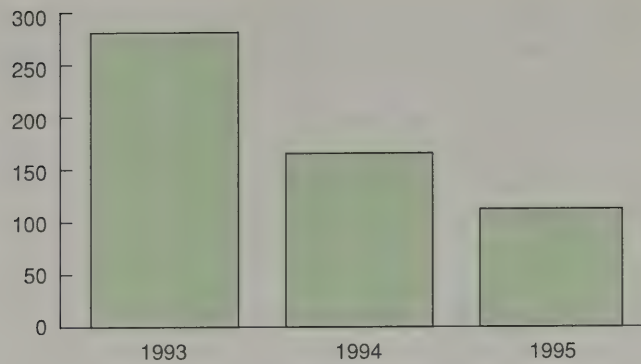
PCR-ELISA is also currently being developed for the convenient detection of rabies virus in a semi-quantitative microtitre plate format. Suitable probes have been identified which will recognise all the *Lyssavirus* genotypes and the test is currently undergoing evaluation with a wide range of rabies and rabies-related viruses.

**Scrapie**

**Scrapie was confirmed in 116 animals on 116 premises in 1995.**

Scrapie was made notifiable on 1 January 1993 by the Specified Diseases (Notification and Slaughter) Order 1992, as required by Council Directive 91/68EEC governing intra-community trade in sheep and goats. Although all suspected cases must be notified, tests to confirm scrapie are not usually carried out for up to two years after a case has been confirmed on a premises, as during this period the flock is not eligible to export breeding sheep to other EC Member States.





**Figure 1.9** Number of premises on which cases of scrapie were confirmed during the years 1993 - 1995

*Research and development  
(VLA Weybridge):  
PrP polymorphisms  
and epidemiology*

Investigations have continued into the association between polymorphisms in the protein coding region of the PrP gene and the occurrence of natural scrapie. DNA sequencing techniques have been used to determine the polymorphisms present at sites 136, 154 and 171 of this gene in affected sheep from several flocks, and in a sample of unaffected sheep from the same flocks. These investigations have demonstrated a strong association between polymorphism at site 171 and the occurrence of natural scrapie in all flocks of all breeds. The presence of codes for glutamine in both alleles at this site was associated with susceptibility to scrapie in all the flocks examined, whereas the presence of arginine (and in occasional cases histidine) at this site was associated with resistance. In some flocks there is also an association between the occurrence of scrapie and polymorphisms at site 136.

Epidemiological data is being collected from several flocks and will be used to assess the incidence of disease and to investigate the independent effect of other risk factors, including maternal scrapie status, on the occurrence of disease.

*Studies to detect Scrapie  
Associated Fibrils (SAF)  
and PrPsc*

Two different methods of detecting scrapie-associated fibrils (SAF) from unfixed central nervous system tissue affected with natural scrapie were compared. Centrifugal extraction of the tissue, a routine technique for preparation of the material for examination in the electron microscope, was compared to a touch-grid technique in which sample grids, used in transmission electron microscopy, were applied to the fresh tissue. The samples were subsequently treated similarly for the visualisation of SAF. While SAF were detected by both techniques, the touch preparation, though more rapidly performed, proved the less sensitive sampling method.

The efficiency of six different extraction techniques were also compared for fibril yield and ultrastructural clarity. Fibril yield was reduced by storage of some extracts at -20°C but not by storage of any of the extracts at 4°C. However, storage of the final extracted pellets at 4°C did reduce the yield of fibrils. In further tests the clarity of visualisation, but not the stability of fibrils on the test grids, was impaired by storage of the grids at room temperature for six months.

Evaluations are in progress on the sensitivity of fibril detection in different anatomical regions throughout the scrapie affected ovine spinal cord, and in peripheral tissues. Efforts to achieve retrieval of SAF from chemically fixed tissue continue.

Collaborative work with researchers at the Robert Koch Institut, Berlin, demonstrated an improved sensitivity of detection of the disease specific form of PrP, by immunoblotting, using a purification method which increased the protein yield.

Projects on the reproducibility of fibril and PrP detection methods, after scrapie-affected brain tissue has been kept in cold storage, and studies of the sensitivity and specificity of these detection methods, using statistically significant sampling of sheep populations, have been initiated. Comparison of SAF and histological examinations for the routine statutory diagnosis of scrapie of sheep is also in progress.

## Sheep scab

**A second four- week survey into the level of scab at markets, carried out in March 1995, indicated that the numbers of scab infested sheep sent to market had declined. However, reports from private veterinary surgeons suggested that the level of scab on farms was increasing.**

The results of this survey and those from last year are as follows:

*Table 1.8 Results of sheep scab surveys in 1994 and 1995*

	1994	1995
Market visits:		
number of visits	869	867
batches with suspected scab	177	47
% of visits where scab was found	20	5
serious welfare cases	13	6
Other outbreaks of scab found by the SVS	53	34
Outbreaks of scab known to private veterinary surgeons	254	595

An autumn publicity campaign was launched to encourage good management practices and the Meat Hygiene Service was asked to report any welfare cases of sheep scab found at abattoirs to the SVS for follow up action. The increased surveillance of sheep sales was continued and between September and December 2218 market days had been surveyed. Sheep scab was discovered on 35 visits with a total of 152 sheep being withdrawn from sale and treated and 343 sheep being sent direct to slaughter.

New proposals were published in a public consultation paper, issued on 21 December 1995. If implemented, it would be a criminal offence not to have treated infested sheep or to offer infested sheep for sale, unless direct for slaughter, and local authorities would be given powers to deal with scab on open or common grazings.

## Tuberculosis

**There was a slight reduction in the number of new confirmed breakdowns in South West England during 1995, but a rise in South Wales and in Hereford and Worcestershire. There is strong evidence of transmission of tuberculosis from badgers to cattle in the majority of**



**cases. A few sporadic breakdowns occur elsewhere usually due to movements of infected animals.**

A total of 2,277,701 cattle in 33,749 herds were tuberculin tested either by Local Veterinary Inspectors or Ministry staff during 1995. A total of 2,896\* animals were slaughtered as reactors to the test, but disease was confirmed either by post mortem findings or culture of *M.bovis* in only 2270 of them. An additional 55 suspected cases were reported from slaughterhouses with lesions suggesting tuberculosis, but disease was only confirmed in 42 of these cases. A further 555 cattle were slaughtered as contacts to confirmed cases.

*Table 1.9 Costs of bovine tuberculosis control*

tuberculin testing		£5.74m
compensation	£1.99m	
less salvage received	£0.68m	£1.31m
staff costs	£5.65m	
tuberculin production	£0.75m	
laboratory diagnosis	£0.31m	
badger control		£1.2m
research	£1.48m	
total		£17.8m

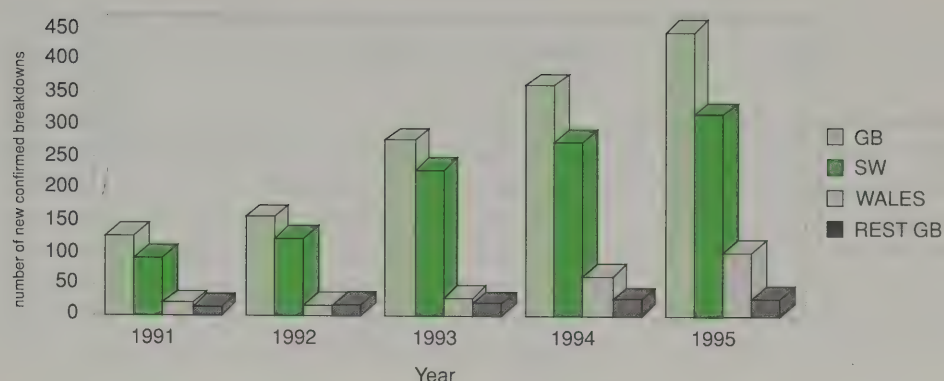
*Table 1.10 The number of new confirmed breakdowns in counties in the South West, West Midlands and South Wales in 1995 (1994 figures for comparison)*

County	1995	1994
Cornwall	81	106
Devon	62	75
Somerset	20	7
Glos & Avon	50 21	63
Wiltshire	27	21
Dorset	6	2
Hereford & Worcester	33	12
Shropshire	2	0
Dyfed	54	38
Gwent/Glamorgan	37	18

The confirmed herd breakdown rate for most of Great Britain has remained below 0.1%, and as permitted by Directive 64/432/EEC, the interval between tuberculin tests in most areas is four years.

The situation in Devon and Cornwall improved, but the increased incidence in Hereford and Worcester is of concern. Many of the 6 affected parishes have no recent history of TB, although some are adjacent to the Gwent and Gloucestershire parishes where infection from badgers has been confirmed. Herds in affected parishes are tested annually. Herds in neighbouring parishes may be tested at intervals of two or three years, depending on local circumstances.

\* 'Animal Health 1994' quoted only confirmed reactors (1,212) where as it should have stated all reactors (2,304).



**Figure 1.10** Bovine tuberculosis – new confirmed breakdowns

### Bovine tuberculosis in badgers

The Wildlife Units (WLUs) based in the South West completed 197 badger removal operations (BROs) in 1995 and four BROs were completed in South Wales using trained Animal Health staff. A total of 1508 badgers were trapped in all BROs carried out in England, of which 412 were positive to *Mycobacterium bovis* on examination, i.e. 27.3%.

The “Live Test Trial”, which began in November 1994, continued during 1995 in the South West although progress was slower than had been anticipated. Since the trial began, a total of 117 Trial BROs have been approved and 36 completed by the end of the year. The badger investigations (BIs) are randomly allocated by the Central Veterinary Laboratory into areas where the live test is used to identify setts with positive badgers (19 BIs) over a number of adjoining premises, and other areas in which only badgers from the breakdown farm are removed (17 BIs). In both these treatment areas, a total of 303 further “at risk” farms surround the breakdown farms, and it is in herds on these farms which are subsequently monitored to determine whether there is a difference in herd breakdown rates between the two allocations. Although it is far too early to draw conclusions, 45% of all badgers in the live test allocation have been positive on culture so far, and 40% for the no live test allocation.

**Table 1.11** Results from the 36 trial BIs started after the 1st November 1994 and completed before 31st December 1995

	LIVE TEST TREATMENT	NO LIVE TEST TREATMENT
Number of BIs	19	17
Badgers ELISA positive	23	
Badgers destroyed	96	174
Badgers positive	43	70
badgers positive	45%	40%

Outside the trial areas, 236 BROs were approved, and 161 were completed in 1995.

The backlog situation has eased slightly due to the recruitment of additional Wildlife Unit (WLU) staff. At the end of the year there were 127 BIs ongoing, and a BRO had started in 54 of them. The average time from herd breakdown to a visit on the farm by WLU staff is 14 weeks for trial BIs and 19 weeks for interim (Dunnet) BIs. This takes into account the time required to confirm cattle disease and complete investigations to exclude other possible sources of infection. There is then a further delay of nine weeks and five weeks on average respectively until the start of badger removals. Trial BIs, once started, take longer to complete compared to interim BIs, i.e. an average of 20 weeks compared to 15 weeks, due mainly to the extra time



required to survey a much larger area within the trial. The trial also requires between two and three times more manpower per BI than interim BIs.

*Research and development  
(CVL, Weybridge):  
Diagnosis of tuberculosis  
in cattle*

Development of a blood test for tuberculosis in cattle is a key research objective. It may be possible to extend the short shelf-life of blood from reactor cattle for use in T-cell assays from eight to 24 hours, which would improve the practicality of laboratory-based whole blood tests. The assays detect proliferation of lymphocytes from infected animals and their production of gamma interferon (IFN gamma) when stimulated with specific *M. bovis* antigens. Techniques are being developed to improve the responsiveness of the cells.

In collaboration with the Institute of Animal Health, Compton, molecular techniques have also been developed to assay the bovine cytokines IL2, IL4, IL10, IFN-gamma, TNF and GM-CSF. These are in use to study changes in antigen-stimulated production of cytokines during experimental *M. bovis* infection of cattle.

*M. bovis* gene libraries were expressed in the non-pathogenic, fast growing host bacterium, *Mycobacterium smegmatis*. Screening of these libraries using sera from cattle infected with *M. bovis* has so far identified two novel antigens. This work may generate new antigens for use in diagnosis. Some mycobacterial proteins are only expressed inside the host and these are the proteins which are most likely to be useful for vaccine development and immunodiagnosis. In collaboration with St George's Hospital, London, a system has been established to grow *M. bovis* inside macrophages. The molecular characterisation of antigens identified by this system is in progress.

Chromatographic techniques and immunological reagents have been developed to analyse tuberculin (PPD). These techniques are being used to investigate the relationships between biochemical and antigenic composition and skin test reactivity in guinea pigs and cattle. This work aims to reduce the use of guinea pigs for quality control during production and, in the long term, to replace PPD with a defined antigen.

**Viral haemorrhagic  
disease of rabbits**

**The first case of viral haemorrhagic disease (VHD) of rabbits in Great Britain was confirmed in 1992. A continuous increase in the number of cases occurred in 1995 mainly in pet rabbits. Five hundred and twelve cases were confirmed compared with ten in 1993 and 200 in 1994. The disease has spread in the wild population to several counties in England and Wales and has been confirmed in wild rabbits in Scotland.**

*Reports and confirmations*

VHD was investigated on 924 occasions and disease was confirmed in 512 cases. A negative diagnosis was made on 42 occasions following clinical or post-mortem examinations and in the remainder samples were submitted to the Central Veterinary Laboratory, Weybridge for laboratory examination. Disease was confirmed by electron microscopy, ELISA and haemagglutination tests.

The 512 premises at which the disease was confirmed comprised pet rabbit keepers, wool producers, small meat producers and show rabbit keepers.

*Viral haemorrhagic  
disease in wild rabbits*

Further cases of viral haemorrhagic disease (VHD) were confirmed in the wild rabbit population during 1995. A total of 31 cases were confirmed during the year.

<b>Warble fly</b>	<b>No clinical or slaughterhouse cases were confirmed in domestic cattle but one clinically affected imported animal was returned to its country of origin.</b>
<i>1994/95 serological survey</i>	<p>The 1994/95 survey revealed an unusually high number of seropositive cases. Of the 177,772 bovine sera screened, 364 animals on 215 premises gave unequivocal positive results to the test, but none were found to have clinical evidence of the disease when inspected by SVS staff. Given the complete absence of reports of clinical warbles over the summer, and the absence of any evidence of damaged hides, it was concluded that the positive results were most probably due to problems with the serological test.</p> <p>The CVL has now drawn up a Standard Operating Procedure for the screening ELISA test. It is hoped that a competitive ELISA (see below) will improve discrimination between seropositive and seronegative animals.</p>
<i>Surveillance</i>	Suspected infestation was investigated in domestic cattle on two occasions but both cases proved negative on serological testing. No slaughterhouse cases were reported in domestic cattle during the year.
<i>Warbles in imported cattle</i>	Strict monitoring of cattle at the time of import revealed one clinically affected bull from France. This animal was re-exported.
<i>Warble fly treatments</i>	Two types of product are available for use against warble fly in cattle – the avermectins and organo-phosphorus compounds. No milk withdrawal period has been established for the avermectins, so they cannot be used in cattle providing milk for human consumption or within 28 days of calving. Both products are very effective in the autumn treatment period but there is some doubt about the effectiveness of spring treatments as these may take place after the warbles have emerged.
<i>Research and development</i>	<p>A competitive ELISA has been developed for the detection of antibodies to <i>Hypoderma</i> species in cattle sera. The test has been validated using a small panel of samples from clinically negative cattle from a warble free area, and samples from clinically positive cattle obtained from colleagues in France, Belgium and Spain (as part of the COST 811 - the European concerted action for improvements in the control of warble fly in farm livestock). Sensitivity and specificity calculated from this panel were 100% and 92% respectively at two standard deviations (SD) from the mean or 92.5% and 98.5% at 3 SD from the mean. The competitive ELISA should prove a useful adjunct to the standard sandwich ELISA which is currently used for routine screening, particularly in the resolution of samples which display non-specific binding properties. During the winter and spring of 1995/6 the test is undergoing further evaluation in a field trial on 100,000 sera.</p> <p>Recombinant techniques have been used to produce antigens which could be used in ELISA for serological detection of hypodermosis. Extensive screening of a <math>\lambda</math>t11 expression library created in <i>E. coli</i> host cells has identified 14 clones with significant antigenic activity. Two of these were selected for further study. Attempts to purify <i>Hypoderma</i> recombinant antigens using a variety of techniques invariably result in either the co-purification of small amounts <i>E. coli</i> host cell proteins and consequent loss of specificity, or loss of sensitivity which is probably due to changes in the conformational integrity of epitopes. The inserts of interest have been expressed in a baculovirus expression system where infected insect cells secrete recombinant virus into the cell culture medium. The supernatant from</p>



these infected cell lines was antigenic. Currently the stability of the recombinants is being assessed.

*A Comparison of ELISA techniques for the serodiagnosis of hypodermosis*

The ELISA tests currently used for hypodermosis serology in Belgium, France, Italy, Spain and the UK were compared in a workshop organised by the Central Veterinary Laboratory under the auspices of COST 811. There was a high degree of correlation between the different countries. All groups achieved over 98% specificity and over 98% sensitivity.

**Waste food processing**

**The number of licensed waste food processing plants has continued to decline gradually, but some of the remaining plants are continuing to expand their output of processed waste food.**

At the end of the year there were 194 licensed processing plants (174 in England, 11 in Wales and nine in Scotland). In addition there are 14 other premises with pigs, receiving processed waste food from licensed processors. The total number of pigs that are being fed processed waste food in Great Britain at any time is about 156,000.

## Disease Surveillance

### *Surveillance by Veterinary Investigation Centres*

*Almost non-stop rain in January and February resulted in extensive flooding in many areas, making it difficult to turn out ewes and early lambs. The wet weather continued for the next two months and this caused problems of mis-mothering in many flocks. Lamb losses, due to hypothermia, were reported to be high, and poor growth rates were evident in those lambs that survived. There was a marked increase in clostridial disease in young lambs; reportedly due to a combination of the unavailability of some vaccines and an apparent unwillingness to vaccinate the ewes in the immediate pre-lambing period.*

*Problems associated with exceeding milk quotas were a feature of the dairy industry in the first part of the year. There were widespread reports that herds were reducing feeding levels in order to reduce milk production and that there were consequential fertility problems. An increased awareness of the need to meet EC milk standards resulted in a considerable effort being made towards the reduction in bulk milk somatic cell counts in many individual herds.*

*The wet weather was replaced in mid-year by a prolonged period of hot dry weather and there were widespread reports of bare pastures and the need to feed extra concentrates and silage to maintain milk yields. Much concern was expressed about the possible lack of silage and hay for the forthcoming housing period.*

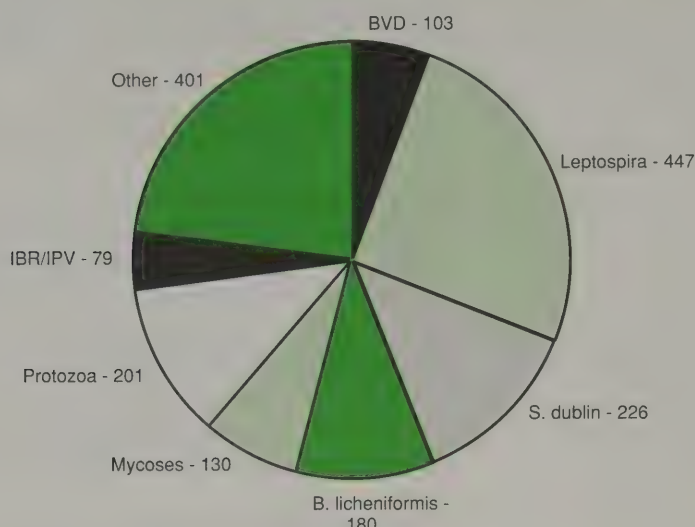
*During this period the migration and survival of endoparasitic larvae on pasture was severely curtailed and there was a significant reduction in cases of parasitic bronchitis in cattle and parasitic gastroenteritis in sheep. Ryegrass staggers was prevalent during the summer, with the disease returning to some parts of the country from which it has been absent for several years.*

*Fears about the lack of conserved feed failed to materialise as wet warm weather in the autumn allowed stock to remain at pasture much later than usual, and farms were able to cut silage in October and exceptionally (in some areas), in November.*

*A year of record high average temperatures ended on a cold note with snow and freezing rain. This was followed by a sudden thaw that caused burst pipes or cut off water supplies, which necessitated the carriage of water to stock by hand for many hours on some farms.*



The infectious causes of abortion identified by the Veterinary Investigation Centres (VICs) during 1995 are summarised in Figure 2.1.



**Figure 2.1** Cases of bovine abortion in England and Wales in 1995

Chlamydial infection was reported by several VICs to be associated with bovine abortion. One case was initially detected at Winchester VIC during routine screening for brucellosis when acid-fast organisms were seen in smears made from a vaginal swab. Infection was confirmed by serology, when a rising antibody titre was demonstrated. Shrewsbury VIC investigated a herd where 14 out of 114 cows had aborted. Only the three latest cases were investigated and although no chlamydial bodies were detected in smears, high antibody titres were demonstrated in foetal fluid and maternal serum. Examination of placental tissue gave positive polymerase chain reaction (PCR) results. Starcross VIC investigated a group of dairy heifers in which there had been an unexpectedly high number of returns to service, followed by a cluster of abortions. Subsequent investigations demonstrated chlamydial infection in seven animals, two of which had reproductive failure and two of the other five had previously shown evidence of respiratory disease. A chlamydial organism was isolated from one placenta submitted to Penrith VIC after four abortions occurred in a group of dairy heifers that were within six weeks of full term. Investigations continue.

*Campylobacter fetus venerealis* was isolated, by Penrith VIC, from the sheath washing of a bull, which was one of four being screened for artificial insemination purposes. In two successive months *Campylobacter fetus fetus* was identified as being associated with bovine infertility, where problems are more typically caused by *C. fetus venerealis*. Aberystwyth VIC isolated *C. fetus fetus* from the placenta of a cow which had aborted at six months gestation and infection was diagnosed by Starcross VIC following the abortion of a five-month-old foetus from a cow in a suckler herd. A hired bull had been introduced into the latter herd last summer, but it only became apparent that fertility was a problem when only 20% of the 34 mixed breed cows became pregnant. Artificial insemination was used successfully on the remainder of the herd.

Several centres reported encountering serological evidence suggestive of active infection with *Leptospira hardjo* in unvaccinated animals that had aborted. Bury St Edmunds VIC commented that there appeared to be an

increasing number of dairy herds that no longer maintain a vaccination programme and that susceptible cattle were being introduced into endemically infected herds. There was an apparent reduction in active leptospiral infection during the dry summer. However this was followed by the inevitable increase when the wet weather returned.

Neosporosis associated abortions were widely reported and “abortion storms” appeared to be fairly characteristic of *Neospora* infection in susceptible herds. Starcross VIC reported that 11 out of 130 dairy cows aborted over a two week period, and Sutton Bonington VIC described another serious outbreak in a dairy herd where 20 cows aborted. The latter Centre commented upon the diagnostic problems of confirming that abortion is associated with infection based on serological results alone and stressed the need to examine aborted fetuses. This was emphasised by Thirsk VIC after they had confirmed *Neospora* infection by immuno-staining of brain tissue from a hairless, autolysed foetus, one which would normally have been regarded as less than ideal.

Salmonella infection was widely reported as the cause of sporadic abortion in dairy herds. In most cases *Salmonella dublin* was isolated, however there were also reports of *Salmonella agona*, *Salmonella typhimurium* and *Salmonella goldcoast* being involved. It was reported to Langford VIC that *S.dublin* had been isolated from a pustular dermatitis which had developed on a veterinary surgeon’s arm following embryotomy of an aborting foetus.

Several Centres reported sporadic cases of abortion due to *Bacillus licheniformis* infection. The Centres commented that this was probably related to the poor quality silage fed during the latter part of the housing period and during the drought period of the late summer and autumn. Shrewsbury VIC made a farm visit to a 50 cow dairy herd that had experienced 13 abortions in the last six months. When a range of tissues were submitted from the two latest abortions histological examination revealed a placentitis in both, one associated with *Aspergillus fumigatus* and the other with organisms resembling *Bacillus licheniformis*. *Listeria monocytogenes* infection was diagnosed by Barton Hall VIC in two separate abortions when the organism was isolated from foetal stomach contents.

Sutton Bonington VIC diagnosed infection with *Coxiella burnetti* (Q-fever) when typical acid fast cocco-bacilli were demonstrated in stained smears of a maternal caruncle from an aborted cow. Serological examination of sera from the dam and another recently aborted cow was positive for Q-fever.

Reproductive problems associated with bovine viral diarrhoea (BVD) virus infection were prominent throughout the year. Several centres confirmed congenital infection, either by isolation of the virus or by the demonstration of BVD virus antibody in blood samples from affected calves. As the source of infection was frequently unknown, herd screening was undertaken on a number of premises in an attempt to discover whether a persistently infected animal was present.

Congenital goitre was diagnosed by Langford VIC when four out of 33 suckler calves died, either at birth or within a few hours. A combination of hyperplastic thyroid glands with very low iodine content and low serum thyroxine levels in the dams confirmed the diagnosis. Concern was expressed about the possible consequences of using rape straw as a bedding material as the cows were known to have eaten substantial amounts in the previous three months. Penrith VIC reported that iodine deficiency appeared



to be widespread in Cumbria as they had encountered multiple cases of goitre in young calves on different farms, all with a history of weakness and poor growth rates.

### *Respiratory disease*

Respiratory syncytial virus was the most commonly diagnosed respiratory pathogen in calves aged under six months of age. *Haemophilus somnus* infection was reported by Newcastle VIC to be associated with peracute pneumonia in a group of housed six-week-old calves. Further examination of lung tissue revealed that there was also concurrent infection with parainfluenza 3 virus. Pneumonia was reported to be widespread in housed animals and several centres reported sporadic deaths in young calves due to infection with *Pasteurella haemolytica*, either as the only pathogen, but more usually in combination with one of *Pasteurella multocida*, *Mycoplasma bovis* or *Haemophilus somnus*.

Infectious bovine rhinotracheitis (IBR) infection was also a common diagnosis, both in young and adult stock. An acute outbreak of disease was reported by Shrewsbury VIC in a dairy herd when seven out of 70 adult cows suddenly developed pyrexia and milk drop and, in one incident described by Barton Hall VIC, a much higher morbidity level was reported when 40 out of 60 cows developed a bilateral ocular discharge. Luddington VIC commented that the fluorescent antibody test (FAT) test on nasopharyngeal and conjunctival swabs was particularly effective for IBR virus in the early stages of the disease. When a large number of cows and calves in a suckler herd began to cough and developed a nasal discharge, examination of nasopharyngeal swabs at Aberystwyth VIC by the FAT gave positive results for parainfluenza type 3 virus. This virus does not often appear to cause disease in adult cattle.

Barton Hall VIC reported that 17 animals had been affected with malignant catarrhal fever (MCF) since the spring of 1992. Circumstantial evidence suggests that the infection may have entered the farm when a group of 30 ewes were purchased in late 1991. Although control measures based on separation of the breeding ewes from the cattle appeared to be effective in 1994 when no new cases were confirmed, two animals were confirmed as MCF positive during 1995. Penrith VIC investigated two outbreaks of MCF where the situation was complicated by the presence of bovine viral diarrhoea (BVD) virus in both herds. IBR virus infection was also found to be present in one herd, resulting in some uncertainty as to which virus was responsible for the main clinical signs in individual animals.

There were widespread reports of outbreaks of parasitic bronchitis. Langford VIC reported that, unusually for April, lungworm larvae had been demonstrated in the faeces of a dairy heifer with diarrhoea. In May Shrewsbury VIC investigated a severe outbreak in a 186 cow dairy herd. Sporadic reports of lungworm infection continued until July when the dry weather conditions no longer favoured the survival and migration of endoparasitic larvae on pasture. Once the rain returned in September there was an increase in the number of reports of outbreaks of parasitic bronchitis. Luddington VIC commented that a number of these involved adult cattle on farms where routine calf vaccinations ceased some years ago.

Lung lesions suggestive of contagious bovine pleuropneumonia (CBBP) led to the Divisional Veterinary Officer being notified on five occasions following sudden death in adult cattle. Post mortem examinations revealed acute pneumonia with a marked fibrinous pleurisy, marbling and oedema of the lung tissue and varying volumes of fluid in the thoracic cavity. On all

occasions tests were negative for CBPP and *Pasteurella haemolytica* was isolated from lung tissue.

A large number of samples from scouring calves were examined by VICs and the diagnoses reached are summarised in Table 2.1.

Table 2.1 Causes of scouring in calves diagnosed at VICs in England and Wales

Diagnosis	1991	1992	1993	1994	1995
Rotavirus	1,620	1,915	2,289	2,564	2,411
Cryptosporidia	832	843	1,414	1,512	1,746
Coronavirus	576	600	481	755	829
Colibacillosis K99	271	283	337	212	149
Other colibacillosis	744	491	544	623	588
Coccidiosis	205	202	272	376	466
TOTAL	4,248	4,334	5,337	6,042	6,189

Housed calves showed the usual range of infections, with rotavirus infection and cryptosporidiosis being particularly prevalent. There were sporadic reports of F41 fimbrial adhesin and K99 antigen positive strains of *Escherichia coli* being associated with acute diarrhoea, dehydration and death in neonatal dairy calves. Multiple antibacterial resistance in some *E.coli* isolates restricted the choice of antibiotic for prophylaxis and treatment.

Eight acute deaths out of a group of 20 dairy calves aged between one and five weeks was attributed by Bury St Edmunds VIC to clostridial enterotoxaemia after epsilon toxin was demonstrated in the intestinal contents. It was suggested that the calves had increased their milk intake to avoid dehydration in the prevailing hot weather as they had no separate access to water.

Cases of necrotic enteritis in suckler calves were reported by several centres. In one case examined by Truro VI Unit *Fusobacterium necrophorum necrophorum* was isolated in anaerobic cultures from a variety of organs. A six-week-old calf examined by Langford VIC had necrotic enteritis of the ileum, caecum and colon, pale mottled kidneys and mucosal abscesses between the tongue and larynx. The calf also had extensive *Dermatophilus* spp. skin lesions, a finding that further supports a previous report that the condition predisposes to secondary bacterial and fungal infection.

An outbreak of bovine papular stomatitis was reported by Winchester VIC in a group of 70 four-week-old dairy calves. Over the period of one week almost all developed vesicular lesions, two to ten millimetres in diameter, that were restricted to their muzzles. The diagnosis was confirmed by the demonstration of parapox virus particles during examination of vesicle material by electron microscopy. Although this condition is said to be common in young cattle it is rarely diagnosed in the laboratory.

Several Centres reported incidents of coccidiosis in young calves. Shrewsbury VIC noted that several incidents had occurred in animals less than six weeks old and suggested that this may be attributable to recent changes in calf husbandry where calves are group penned, provided with ad lib milk dispensers and straw taken from the bedding is the primary source of long fibre. Bury St Edmunds VIC described a particularly severe outbreak that occurred amongst a group of 50 nine-month-old animals in which the entire group had a severe watery diarrhoea, including several with marked dysentery. The affected animals had been born during the autumn and winter and this was the first time that they had been out to grass.



*E. coli* serotype 0157 infection is a potential cause of serious illness in man and Starcross VIC investigated the possible origin of an infection, acquired by a milker, which developed into haemolytic uraemic syndrome. Examination of the cows showed a faecal carriage rate of 9%; a much higher herd prevalence than that seen in similar incidents elsewhere.

Investigations into the epidemiology of *Salmonella typhimurium* DT 104 in both young and adult cattle featured prominently throughout the year. The sometimes acute nature of infection was reported by Carmarthen VIC after 17 animals developed dysentery in a single 24 hour period. Bury St Edmunds VIC described one serious outbreak of *S.typhimurium* infection where nine out of 190 dairy cows died soon after calving, 12 calves also succumbed and there were numerous other clinical cases that recovered. The striking feature of an investigation visit made by Langford VIC to a dairy herd was the number of starlings populating the farm buildings. Environmental sampling showed the organism to be widespread within the cubicle houses, within the maize silage in the ring feeders, in bird faeces from various parts of the farm and in the dust from the isolation box. Whether the starlings introduced the infection to the farm was debatable, but it was suggested that they were responsible for heavy contamination of the environment and that they were also a potential danger to neighbouring farms.

*Salmonella dublin* infection was diagnosed by Penrith VIC in a herd that was selling unpasteurised milk. The organism was isolated from bulk milk and the alimentary tracts of both cows and calves. The case was discussed with the veterinary practice and the local environmental health authority.

Acute BVD infection was reported by several centres to have caused milk loss, pyrexia, severe watery scour, salivation and nasal discharge in dairy herds. There were widespread reports of mucosal disease and the identification of persistently viraemic animals. Investigations into herds that had previously been free of infection suggested that a common source of infection was either the introduction of a recently purchased bull, or the use of a hire bull. Langford VIC described an incident where six out of 31 eighteen-month-old replacement dairy heifers succumbed to mucosal disease. The remaining 25 heifers were tested and a further eight were found to be persistently infected. It was also reported that some of the near contemporaries of this cohort had been born with congenital defects.

Problems associated with fascioliasis were reported throughout the South West, Wales and the Midlands. Starcross VIC noted that fascioliasis had clearly returned to areas where it had been unseen for many years with separate incidents confirmed from widely dispersed areas throughout Cornwall and Devon. Cases were also reported by Penrith and Sutton Bonington VIC, with both centres noting that it was a relatively uncommon diagnosis in their respective areas.

Fatty liver syndrome was a problem in some herds over the winter period and the *ad libitum* feeding of maize silage to mid and late lactation cows was considered to be a predisposing factor, especially when it led to over-fat Holstein cows. Several Centres reported incidents of a transient acidosis in dairy cows reaching peak lactation. Langford VIC commented that the high starch content of many maize silages had been found to be the main causal factor.

A serious outbreak of acidosis which killed almost half of a group of 60 yearling bulls, housed in three pens, was investigated by Langford VIC. The animals had been receiving maize silage with some barley sprinkled on top when the diet was suddenly changed to grass silage, which was probably less palatable, and ad lib barley. By the following afternoon two animals had died and several others were very dull, staggering and had diarrhoea. A total of 29 animals died during a period of 24 hours. Others that were less severely affected recovered. A similar diagnosis was made by Thirsk VIC following the death of six nine-month-old heifers over a seven day period. The group had been fed sugar beet pulp and barley and deaths ceased when extra long fibre was introduced to the ration.

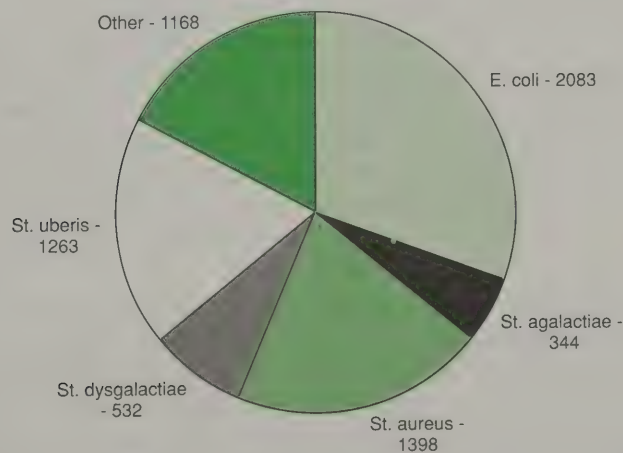
Fat poisoning was suspected by Sutton Bonington VIC in a dairy herd with an increased incidence of right displacement of the abomasum. The problem appeared to coincide with the feeding of potato waste, which had a high fat content, from a potato chip factory.

Despite early warnings given on the radio and in the farming and veterinary press of the potential risks associated with the bumper crop of acorns this year, there were widespread reports of deaths due to acorn poisoning in stock of all ages.

### Diseases of the udder

There was a noticeable increase in the number of mastitis milk samples examined during the second half of the year and in particular there was a large number of batch submissions from herds facing increasing penalties for high bulk milk somatic cell counts.

The causes of mastitis identified by VICs are indicated in Figure 2.2.



**Figure 2.2** Cases of bovine mastitis in England and Wales in 1995 (number of cases)

Diagnoses from single samples during the housing periods were dominated by environmental organisms with *Streptococcus uberis* and *Escherichia coli* being most frequently isolated.

Centres carried out a large number of advisory visits to herds with high bulk milk cell counts and several commented that herds with mastitis problems often failed to practice the preventative measures outlined in the Five Point Plan. *Staphylococcus aureus* and *Streptococcus agalactiae* were frequently found to be associated with these problems. Shrewsbury VIC isolated coagulase negative staphylococcal organisms, identified as *Staphylococcus*



*xylosus*, from ten out of 14 milk samples from a herd with a persistently high bulk milk somatic cell count. Although it has been debatable for some time as to whether coagulase negative staphylococci are of importance, there is evidence from the United States that they may be potential mastitis pathogens.

*Streptococcus zooepidemicus* was isolated from milk samples at both Shrewsbury and Winchester VIC. As this organism can be a serious human pathogen the local Medical and Environmental Health Authorities were notified and consumption of raw milk on the farms was stopped. All the milk was pasteurised prior to entering the food chain and advice was given to ensure that any milk taken from the bulk milk tanks for local use was boiled.

*L. monocytogenes* was isolated by Bury St Edmunds VIC from a mastitic milk sample from a cow in a herd with a recent history of cerebral listeriosis. A repeat sample yielded the same organism in pure growth. It was suggested that the infection was associated with the feeding of poor quality, soil-contaminated silage and appropriate steps were taken to protect public health.

Poisoning due to the ingestion of toxic algae was diagnosed by Shrewsbury VIC in a milking herd. The herd had been turned out onto a new pasture containing a well established pond during the mini heat wave in the first week of May. Within 24 hours, 60% of the cows were scouring profusely and milk yields had dropped by one third of that expected. No pathogens were revealed during examination of faecal specimens. Water taken from the pond was rich in the blue-green algae *Anabaena Flos-aqua*. Immediate removal of the cattle from the pasture resulted in no deaths, spontaneous recovery and return to expected milk yields.

Bury St Edmunds VIC reported the unusual persistence of severe pseudocowpox lesions on the teats of up to 80% of a 140-cow dairy herd. This had been an almost continuous situation for the previous two years and although lesions on individual teats appeared to resolve they soon reappeared on other teats. The herd had contact with a sheep flock which had a history of orf and orf vaccination over the past two years. Two relief cowmen, who also had contact with the sheep, had been affected with typical "milkers node" on their hands.

Carmarthen VIC made a farm visit to a dairy herd from which the milk was reported to be tainted. Further investigations revealed that the tainted milk had actually come from a neighbour's farm and tests indicated that the taint was due to the presence of phenol and low levels of hypochlorite. Although the phenolic taint cleared, the neighbour sought veterinary advice when the milk from his herd again failed tests because of a reported "perfumed taint". Subsequent blood tests from freshly calved cows showed one cow to be severely ketotic and four of the remaining five tested had evidence of significant energy deficit. The cows were being fed big bale silage cut in 1994.

#### *Miscellaneous conditions*

Several Centres commented on the changes in the dairy industry, especially those relating to milk quotas.

Many farmers that were over quota attempted to compensate by reducing feeding levels in order to reduce milk yields. A combination of this, a changing calving pattern and poor grass growth due to the dry weather, resulted in an increase in the number of cases of periparturient metabolic disease.

A number of Centres commented on the need to provide supplementary forage to dairy herds throughout the late summer and the problems that this may cause towards the end of the winter housing period. In addition to the primary shortage of feed there were other associated problems. Hypocupraemia was demonstrated on a number of occasions in dairy cows by Barton Hall and Langford VIC. The latter commented that the inevitable increase in intake of molybdenum and other heavy metals by cattle grazing bare pastures was likely to cause widespread copper deficiency unless appropriate preventive measures were taken.

Several Centres reported incidents of bracken poisoning in the early part of summer when pastures were short of grass. Typically, affected animals exhibited widespread haemorrhages, pale bone marrow and abnormal blood total white cell and thrombocyte counts.

Hypovitaminosis A, affecting the fattening stock only, was diagnosed by Luddington VIC on a mixed dairy and beef farm following an initial clinical report of blindness affecting 430 kg finishing cattle. Ophthalmoscopic examination of four of seven animals exhibiting striking pupil dilatation, showed evidence of retinal degeneration. The problem had been precipitated following a decision to reserve all silage, in the face of limited crop availability, for the dairy herd. Beef cattle had been fed a straw and cereal/fishmeal ration with minerals, but excluding any vitamin supplementation. A similar diagnosis was made by Thirsk VIC in two separate incidents where bulls aged eight to nine months were reported to be going blind. Both groups were housed and were being fed home produced rations.

Spontaneous femoral fractures were reported, by Starcross VIC, to have occurred in five four-month-old calves. The calves had been fed on watered down milk, supplemented with poor quality hay, until weaning. Subsequently they had received a barley-soya mix and hay. All the calves on the farm were dull and depressed and examination of blood samples revealed low vitamin A, vitamin E and glutathione peroxidase levels. Appropriate dietary advice was given and following supplementation with concentrates, a vitamin/mineral mixture and the parenteral administration of multivitamins there was a very rapid improvement.

Incidents of nitrate/nitrite poisoning in cattle grazing stubble turnips were reported in late autumn by Truro VI Unit, and Langford VIC and Starcross VIC. A very dramatic outbreak was investigated by the Truro VI Unit in a group of 76 in-calf heifers and dry cows. Inspection of the group, by the farm manager, late in the afternoon revealed two dead heifers and six which were sternally recumbent and described as "sleepy". On returning half an hour later with help to remove the remaining animals from the turnips, he found the six "down" heifers dead. Four days later six animals, all within two weeks of calving, aborted and another subsequently died during calving. All the Centres involved commented that these outbreaks were likely to be due to the limited grass growth and minimal uptake of nitrogen during the drought, followed by the subsequent rapid plant growth and uptake of fertilizer in the autumn rains. All the incidents occurred during a time of severe frost when a reduced rate of carbohydrate synthesis would have allowed nitrate accumulation, particularly in the foliage.

Barton Hall and Langford VIC reported separate incidents where dosing with an intraruminal anthelmintic bolus resulted in calf deaths. In the first case the product had been used in two seven-month-old calves weighing 92



and 65 kgs respectively. In each animal the product had perforated the pharynx and become lodged in the soft tissue adjacent to the oesophagus, resulting in infection. In the second case twin three-month-old calves were involved and perforation of the oesophagus in both animals had resulted in extensive cellulitis. Investigations indicated that misunderstanding of the size restrictions was responsible for the problem. The data sheet clearly recommended a minimum body weight of 100kg.

**Sheep**  
*Reproductive disease*

Pregnancy toxemia was reported to be a common problem throughout the country in February albeit for various reasons. Many flocks were reported to consist of over-fat ewes, whereas in others the body condition of the ewes had been overestimated and this had led to an inadequate diet being fed in the prelambling period.

During the lambing season Centres examined 4,666 abortion associated submissions. An infectious agent was diagnosed in 62% of cases and a summary of those are given in Table 2.2.

Table 2.2 Causes of abortion in sheep diagnosed in VICs in England and Wales.

Diagnosis	1991	1992	1993	1994	1995
Chlamydiosis	913	847	849	894	1551
Toxoplasmosis	761	587	511	498	733
Campylobacter	247	167	104	168	257
Listeria	69	62	44	46	79
S.dublin	3	10	7	11	14
Other salmonella	50	25	28	42	74
A.pyogenes	17	18	22	20	34
Coxiella (Q fever)	4	3	2	1	1
Mycoses	8	6	5	2	1
Total abortion submissions	4,596	3,362	3,969	4,274	4,667

Although chlamydial abortion dominated the diagnoses during February and March, toxoplasmosis was the most common diagnosis during April. Several Centres noted many of the later lambing flocks were either from hill flocks, or were ewe lambs, neither of which had previously experienced infection with toxoplasmosis. There were occasional reports of chlamydial abortion in flocks of milking sheep and in each case appropriate advice was given regarding the zoonotic implications. Several Centres noted that abortions due to infection with *Campylobacter fetus fetus* were unusually prominent. Losses in flocks ranged between 5% and 20% and Langford VIC reported that 50 out of 650 ewes aborted in one flock, 35 of which were in their second pregnancy. There was a farm history of abortions on a four to five year cycle due to campylobacter infection.

There were sporadic reports of infection with Border disease virus and Luddington VIC reported that in one flock of 150 homebred ewes, at least 50% of all the lambs born were described as “hairy shakers”. The unusual feature of this case was that border disease had been previously recognised on this farm, yet this flock of ewes remained fully susceptible to infection.

*Respiratory disease*

Pneumonic and systemic pasteurellosis was the most prevalent disease diagnosed in young lambs in late spring. Although most cases were due to infection with *P.haemolytica*, Bury St Edmunds VIC isolated *P.multocida* from one case and noted, that although it is not a common cause of disease in sheep, it may occasionally cause problems. The pathogenesis and epidemiology does not differ significantly from the disease caused by *P.haemolytica*.

Several Centres recorded incidents of verminous pneumonia associated with *Dictyocaulus filaria* throughout the summer and early autumn.

With the onset of wet weather in the late autumn there was a significant increase in the incidence of pasteurellosis and many of the submissions were accompanied by a variable vaccinal history. For a variety of reasons few of the flocks investigated appeared to have been fully vaccinated according to the manufacturer's recommendations. Several Centres reported that concurrent parainfluenza type 3 viral infection was a complicating factor.

#### *Alimentary disease*

Despite the poor weather conditions in the first two months of the year there were few reports of deaths in neonatal lambs due to watery mouth. Neonatal scours in one flock, where 15% of the lambs were affected with an acute orange coloured scour was reported by Barton Hall VIC to be associated with rotavirus infection. Many flock owners give colostrum to new born lambs as a routine practice. Truro VI Unit examined two-week-old lambs with perforations of the oesophagus. Although colostrum had been given to all new born lambs it had been carried out using an old, stiff, plastic stomach tube, which was 35 centimetres in length, and this was considered to have damaged the distal oesophagus, resulting in abscessation and spread of infection to the adjacent lung tissue. Appropriate welfare advice was given to prevent the occurrence of further cases.

As the wet weather continued into March and April there was an increased incidence of mis-mothering in some flocks, with affected lambs becoming hypoglycaemic, dehydrated and eventually hypothermic. Where lambs survived mismothering there was a significant effect on lamb growth and there were several reports that young lambs at grass were showing dietary disorders. Post-mortem examination of fatalities frequently revealed abnormal development of the stomachs and this was considered to be due to the lack of milk and the effects of grazing at a young age. The usual spectrum of coliform infections, joint-ill, liver abscess, cryptosporidiosis and poor colostral absorption were also reported by most Centres as the cause of sporadic losses in young lambs.

A significant increase in the number of cases of lamb dysentery and pulpy kidney disease was reported in young lambs aged between six and twelve weeks. The vaccination history of the affected flocks was often quite different, but the one common theme that emerged was the reported unavailability of some clostridial vaccines in the immediate pre-lambing period. As a consequence young lambs in some flocks had received little, or no, maternal protection against clostridial diseases.

The hot dry weather in July was a significant factor in reducing the number of incidents of coccidiosis and parasitic gastroenteritis as compared with previous years. This situation persisted until September when the wet weather returned. By November parasitic gastroenteritis problems were widespread in all ages of sheep. Examination, at Luddington VIC, of several ewe lamb casualties from a group of breeding replacements purchased in the autumn revealed acute pneumonia and haemonchosis. Disappointingly the purchased animals had not received any prophylactic anthelmintic treatment. The Centre commented that there is a good case for quarantine and worming of purchased sheep to minimise the risks of introducing anthelmintic resistant species.

Benzimidazole resistance was suspected by Carmarthen VIC when four lambs out of a group of 200 were found to have heavy burdens of *Ostertagia*



and *Trichostrongyle spp* at post mortem examination. Although all the flock was reported to have been treated, losses had continued and faecal egg counts had not diminished. Resistance was confirmed in in vitro tests carried out at the Central Veterinary Laboratory. After treatment with an alternative form of anthelmintic the losses and diarrhoea ceased and the condition of the lambs significantly improved. In several other flocks it was initially suggested that the problem was associated with anthelmintic resistance. However, further enquiries frequently indicated management deficiencies. The most common of these were that the flock was returned to the same pasture immediately after worming; and that periods between treatments were too prolonged. The other major errors were the inaccurate estimation of body weight and inaccurate dispensing of the appropriate dose of anthelmintic. These problems need to be corrected before pursuing the question of anthelmintic resistance.

Unusual parasitic problems were reported in October. Haemonchosis was diagnosed by Thirsk VIC in six-month-old lambs showing signs of emaciation and anaemia. *Haemonchus contortus* is rare in the north of England and its occurrence probably reflected the high summer temperatures. Penrith VIC reported that an unusual feature for that time of the year was the finding of several flocks of lambs with nematodiriasis.

Sutton Bonington VIC reported three cases of abomasal impaction in adult ewes from widely separated locations. In two cases the losses were described as outbreaks of "sudden death", whereas in the third there was a history of weight loss, anorexia, depression, ventral abdominal distension and eventual death. Previous reports in the literature suggested that this condition may be associated with scrapie. However, each of these was examined for scrapie, with negative results.

Johne's disease was diagnosed by Aberystwyth VIC in a flock where some of the ewes were emaciated. Intestinal lesions were present in the region of the ileocaecal valve and organisms, typical of *Mycobacterium paratuberculosis*, were seen in smears from the affected area.

Acorn poisoning was prominent throughout the autumn period and there were anecdotal reports of significant losses in some flocks. Clostridial enterotoxaemia was also common in the autumn, especially where lambs had not been vaccinated since birth and were turned onto root crops.

#### *Miscellaneous conditions*

There were widespread reports of outbreaks of sheep scab. Centres found that when flocks were in the midst of lambing, this posed considerable difficulties in the choice of treatment. Several Centres commented on the range of products being used for treatment. Penrith VIC investigated a case of suspected flumethrin resistance in which lambs dipped on five occasions over a period of seven weeks were found to have live mites two weeks after the last dipping and the sheep themselves showed clinical signs of advanced scab.

The isolation of *Corynebacterium pseudotuberculosis* by Barton Hall VIC confirmed clinical suspicions of caseous lymphadenitis in a ewe with a facial abscess and enlarged regional lymph nodes. The accompanying history indicated that seven out of 60 were similarly affected. Anecdotal information indicated that responsible flock owners were becoming increasingly aware of the problems associated with importing this disease into their flocks.

Several Centres reported cases where the lesions were typical of drenching gun injuries. A typical case was described by Newcastle VIC when two

weeks after they received oral anthelmintic treatment, 40 out of 1,100 lambs became ill and six died. Post mortem examinations revealed abscesses in the pharynx and tracking lesions through the muscles of the neck to the atlanto-occipital joint. Many of the incidents were associated with the use of a new drenching gun and appropriate welfare advice was given in each case.

There were widespread reports of ryegrass staggers in both lambs and adult sheep. The problem was particularly prevalent in the early autumn and Bury St Edmunds VIC commented that the slight flush of grass following the recent rain may have encouraged closer grazing by the sheep, thus increasing the intake of toxin from the base of the herbage. Following the long hot summer it was particularly difficult to put into practice the usual advice of moving affected stock to fresh pasture.

Clinical maedi and visna were confirmed by Bury St Edmunds VIC in a flock in East Anglia. Over a period of several months approximately 30 out of 1200 ewes have been affected. Clinical cases of maedi presented as thin dyspnoeic ewes, whereas those affected with visna exhibited a range of neurological symptoms, which included blindness, circling, head tilt, gait abnormalities and recumbency.

There were reports of sporadic cases of delayed swayback from many of the centres. In a number of cases the ewe flock had received no concentrate feed during pregnancy as the respective owners had considered them to be in good body condition. Sutton Bonington VIC reported one case where 20 out of the first 65 lambs were reported as weak and spastic.

Newcastle VIC made a diagnosis of copper poisoning when two lambs died suddenly. The owner had been using a mineral supplement intended for calves to help fatten the lambs without appreciating the implications. Although the liver copper levels were elevated in both cases they were not considered a threat to food safety.

An unusual case of gid was reported by Aberystwyth VIC when a mature ewe developed nervous signs, including abnormal gait and unilateral blindness. Seventeen sheep were reported to have died during the year after showing similar signs. This case was unusual in that many of the affected sheep were mature ewes, whereas the condition most commonly affects animals aged between six and 18 months.

An explosive outbreak of ovine infectious keratoconjunctivitis was reported by Winchester VIC to have affected a 300 ewe flock nine days after the commencement of trough feeding. Examination of conjunctival smears by FAT was positive for *Mycoplasma conjunctivae* and for *Chlamydia psittaci*.

Starcross VIC visited a flock experiencing problems at lambing of delayed milk letdown, swollen asymmetrical udders and consequent atrophy of affected quarters. Two flocks, one lambing in spring and the other in the autumn, were affected, with the unusual udder swelling seen only in the latter. No evidence of mastitis could be found and investigation revealed a very high standard of husbandry with regular checks on udder condition post weaning and pre-lambing. About 25% of the flocks were affected with the respective conditions. Examination of blood samples showed moderate or high titres to *Leptospira hardjo* in five out of seven animals. A similar syndrome has been reported in the literature and investigations are continuing.



## Pigs

### Reproductive disease

There were widespread reports that porcine respiratory and reproductive syndrome (PRRS) virus and swine influenza virus infections, either alone or as concurrent infection, were associated with poor performance with reproductive and respiratory disease. A sudden increase in the number of stillbirths per litter and an increased rate of return to service was frequently associated with seroconversion to PRRS virus.

Porcine parvovirus antigen was demonstrated, by Thirsk VIC, in mummified foetuses in a classical parvovirus outbreak. The Centre commented that this kind of outbreak is now uncommon. Elsewhere there were sporadic cases, particularly in herds that had only been partially vaccinated and these often resulted in an urgent review of the vaccination regime.

*Leptospira bratislava* infection was diagnosed by several Centres in herds experiencing irregular returns to service and abortion. Case histories often referred to abortions occurring three to four weeks before full term.

Bury St Edmunds VIC commented that the hot weather, shortening day length, combined with PRRS and influenza confused and complicated investigations into reproductive failure. In one instance, however, late abortion, over a period of five days, in 29 out of 96 gilts was associated with movement from cool indoor accommodation to a hot unshaded field.

Starcross VIC reported incidents of reproductive failure that were associated with swine erysipelas. Although the herds had been vaccinated against erysipelas the antibody titres were too high to be solely associated with vaccination. Further investigations revealed that these herds frequently had concurrent infection with swine influenza. Similar findings had previously been reported from other parts of the country where erysipelas vaccine appeared to have failed.

### Respiratory disease

The multi-factorial aetiology of porcine pneumonia was demonstrated by Luddington VIC when they investigated an outbreak of acute respiratory distress and high mortality in a group of ten-week-old pigs purchased five weeks previously. Rising antibody titres to PRRS and to porcine respiratory coronavirus were demonstrated in blood samples and *Pasteurella multocida* and *Salmonella cholerae suis* were isolated from lung tissue. *S. cholerae suis* was also isolated by Langford VIC from lung tissue from a four-month-old pig following an outbreak of coughing in the herd.

Infection with swine influenza H1 variant 195852 was diagnosed on three separate occasions by Thirsk VIC and in one case in six-week-old pigs, it was combined with inclusion body rhinitis. Atrophic rhinitis was diagnosed on a number of premises by the same Centre.

Respiratory disease seen on fattening units was often associated with *Actinobacillus pleuropneumoniae* infection and the post mortem findings were frequently of consolidated lung tissue and a fibrinous pleurisy. Concurrent infection with *Pasteurella multocida* was not uncommon. Glasser's disease (porcine polyserositis) was diagnosed by Newcastle VIC in three-month-old pigs affected with coughing and diarrhoea. Post mortem examination revealed pneumonia, pericarditis and peritonitis, and *Haemophilus parasuis* was isolated.

### Alimentary disease

Several Centres reported incidents of sudden death in neonatal piglets due to clostridial enterotoxaemia. In one outbreak described by Thirsk VIC up to 60% of piglets born in some litters died within the first 48 hours. Clostridial

enteritis was diagnosed by Barton Hall VIC when pre-weaning mortality reached 20% on a breeding unit. Although *Clostridium perfringens* type C is normally associated with this problem, Winchester and Thirsk VIC confirmed type B infection by the demonstration of toxin in intestinal contents.

Colibacillosis, in both unweaned and weaned pigs, continued to be common with a range of *E.coli* serotypes being identified. Sutton Bonington VIC reported that *E.coli* serotype G1253 was responsible for scour and sudden death in four-week-old pigs and *E.coli* serotype "Abbotstown" was responsible for similar signs in seven-week-old pigs. Several Centres reported infection with rotavirus to be the cause of widespread diarrhoea in piglets under one week of age. Among several reports of coccidiosis, due to infection with *Isospora suis*, Shrewsbury VIC noted that the problem had re-emerged in two-week-old pigs on a unit where it had been diagnosed in the past. The floors of the pens were old concrete with many cracks and crevices which allowed oocyst survival. Luddington VIC reported a similar situation when pre-weaning mortality on a 500 sow unit doubled when pigs aged ten to 14 days showed diarrhoea and rapid death, with no response to antibiotics. Damage to concrete floors in the farrowing rooms, by a high pressure washer, was thought to be a contributory factor.

There were several reports of severe outbreaks of salmonellosis, due to infection with various phage types of *S.typhimurium*, in fattening pigs. Although some of these outbreaks were short lived, they frequently resulted in weight loss and subsequent uneven growth rates. Bury St Edmunds VIC reported that salmonellosis was common in weaners. During one month they isolated *Salmonella derby* and K88 positive *E.coli* from a group of four-week-old pigs, *S.typhimurium* DT193 from four-week-old weaners and two other isolates of *S.typhimurium* from seven to nine-week-old pigs.

Although the number of diagnoses of swine dysentery continue to be reduced it still remains a significant cause of disease, especially in weaned pigs between three and five months of age. *Serpulina coli* was isolated on three occasions by Sutton Bonington VIC. Two of these were from faecal samples from herds with a history of colitis and the third was following a post mortem examination on a pig with lesions of proliferative intestinal adenomatosis affecting the terminal ileum.

#### Miscellaneous Conditions

Iron deficiency anaemia was diagnosed by Thirsk VIC, in pigs aged three weeks with blood iron concentrations of 1.5  $\mu\text{mol/l}$  compared with reference range of between 11 and 32  $\mu\text{mol/l}$ . Starcross VIC reported that one farmer had tried out one of the colostrum substitutes in lieu of iron injections. High mortality was experienced in batches of piglets born in a two week period with the signs of microcytic hypochromic anaemia, typical of iron deficiency. The situation was further complicated as the piglets had developed enteritis. *S. typhimurium* had been isolated, and *Eperythrozoon suis* infection was suspected following the examination of blood smears. No further losses occurred following the reintroduction of iron injections.

*Actinomyces pyogenes* was isolated by Newcastle VIC from a large swelling on the mandible of a routinely slaughtered pork weight pig. Five out of 35 heads had been condemned at slaughter because of similar lesions. The lesion, which involved fibrous tissue and proliferation of compact bone, was centred on the second premolar tooth where there was evidence of an earlier injury to the mucus membrane. The practitioner suspected that the problem was caused by damage from the nipple drinkers.



Several investigations into possible incidents of notifiable diseases arose from the surveillance activities within Centres. Classical swine fever (CSF) was suspected following separate post mortem examinations carried out at a number of Centres. In each case examinations were negative for CSF, African swine fever (ASF) and bovine viral diarrhoea virus (BVD). The possibility of a notifiable vesicular condition of pigs led to Luddington VIC alerting the local Animal Health Office and an on-farm investigation by a Veterinary Officer (VO). Two live piglets and one dead, aged about one month, showed foot lesions including heel erosion and under-running of the horn, as well as inflammation of the coronary bands. In addition, all three showed marked necrosis of the tongue epithelium and some erosion around the snout. The accompanying history indicated poor thrift and diarrhoea in piglets, mainly from the litters of gilts, with some evidence of agalactia. The on-farm investigation eliminated the possibility of notifiable disease and confirmed that the lesions were confined to one litter. No pathogens were identified and the possibility of a toxic cause was considered.

Thrombocytopaenia purpura was diagnosed by Bury St Edmunds VIC in two piglets aged two weeks from a farm where six litters had been similarly affected and which had resulted in approximately 40% pre-weaning mortality in the previous month.

Thirsk VIC reported that 270 out of 278 three-month-old pigs died overnight due to a ventilation failure in a fattening house. The pigs were checked the evening before and all were well. Although the ventilation system was computer controlled, no fault was registered on the computer. The Divisional Veterinary Officer (DVO) was informed of the incident and a welfare visit was carried out. Investigations revealed that essential electrical maintenance work had resulted in the fail safe system accidentally being left in the manual mode. Checks were carried out to ensure that the system was fully operational.

*Clostridium sordellii*, a very potent toxin producer, was isolated by Shrewsbury VIC. It is thought that this is the first time it has been described in pigs. A three-year-old sow on an outdoor pig unit died suddenly within 24 hours of farrowing. The practitioner reported cyanosis of the skin of the udder and perineum. There had been several other sow deaths on the unit over the previous few months where clostridial involvement had been described and in this case the organism was isolated from a sample of pericardial fluid. Investigations continue.

Two new *Streptococcus suis* serotypes were isolated, apparently for the first time in the UK. Firstly *S. suis* type 15 was isolated in septicemic distribution from a three-week-old piglet by Sutton Bonington VIC whose death had been sudden and where no specific lesions were noted at post mortem. *S. suis* serotype 24 was isolated by Shrewsbury VIC from piglets, aged between six and ten weeks, that presented either as sudden deaths or as rapid death showing terminal nervous signs. Post mortem examination revealed excess peritoneal fluid and intensely congested livers. There was a variable excess of pericardial fluid with fibrin strands and most anterior and regional lymph nodes were enlarged.

## Birds Poultry

A wide variety of conditions were seen in submissions from backyard and free range flocks. These included blackhead, ascariasis and Marek's disease, together with various husbandry problems. *Salmonella pullorum* infection was diagnosed in three small flocks by Langford VIC and Sutton Bonington VIC and in one incident only two out of 100 one-day-old chicks, brought onto a farm of mixed traditional breeds, survived.

A batch of seven-day-old broiler birds with obscure central nervous signs were submitted to Shrewsbury VIC for examination. Some of the live birds were somersaulting backwards, others were trembling and some had a splayed leg stance. *Salmonella enteritidis* was isolated from the liver and histological examination of the brain revealed an extensive meningoencephalitis. Vitamin B2 (riboflavin) deficiency was suspected by Bury St Edmunds VIC as the cause of lesions in six-week-old chickens. Affected birds were described as having unsteady gaits, trembling heads and curled toes. It was noted that secondary deficiency may occur where absorption is prevented even though adequate vitamin B2 is present in the diet.

Infectious bursal disease was reported by Winchester VIC to have caused high losses in a flock of 40,000 broiler chickens, with mortality reaching 400 birds per day at 22 days of age. The acute onset of infectious bronchitis (IB) infection in a broiler unit was diagnosed by Shrewsbury VIC as the cause of rapid mounting losses that reached over 200 birds a day by day five of the outbreak. All birds examined had significant antibody titres to IB and IB antibody was also detected in the sinus fluid. None of the birds had previously been vaccinated against IB.

Infectious laryngotracheitis virus infection was diagnosed by Barton Hall VIC following the examination of 16-day-old broiler chicks that showed abdominal breathing and had a hunched appearance. Bury St Edmunds VIC diagnosed similar infection as the cause of respiratory disease and tracheal lesions in point-of-lay pullets and noted that it was an uncommon diagnosis in their area.

## Turkeys

Several Centres reported losses in turkeys being produced for the Christmas market due to starve out, colisepticaemia, blackhead, erysipelas and pasteurellosis.

Examination of a batch of five-day-old turkeys at Bury St Edmunds VIC revealed lung lesions typical of aspergillosis and these were most likely related to hatchery hygiene problems. Subsequent submissions again showed lesions of aspergillosis and in one group of poults a salmonella organism with an antibiotic sensitivity pattern suggestive of *S.typhimurium* DT104 was also isolated. Sutton Bonington VIC reported that a number of incidents of *S.typhimurium* DT104 infection had been identified in growing turkeys during the latter part of the year.

Two eight-week-old turkeys were received by Barton Hall VIC from a small flock of 50 with a history of ocular and nasal discharge. Ten birds had died and 75% of the flock were affected. The infra-orbital sinuses were swollen and filled with caseous exudate and serological examination was positive for *Mycoplasma gallisepticum*.

## Gamebirds

Starve out, rotaviral enteritis and yolk sac infection caused significant mortality in young pheasant chicks on some estates and this sometimes led to uneven growth rates in the survivors. Trichomoniasis and hexamitiasis were prominent in six to eight-week-old poults and much concern was expressed following the withdrawal of dimetridazole from the list of available therapeutics.

Winchester VIC investigated an outbreak of botulism in gamebirds. Initially there were sporadic losses in a group of three to five-week-old pheasant poults. The situation then escalated when 14 out of 200 died with signs of ataxia, and two mallards sharing the same food source also died. A further 47



birds died the following day. The houses and feeders were cleaned and a new diet provided. No further losses occurred until a week later when the remnants of the original food were re-introduced and birds again became ataxic and died. Following post mortem examination *Clostridium botulinum* type C toxin was demonstrated in extracts of pooled liver tissue. Enquiries revealed that other bags of feed within the same batch had been fed without problems.

Infectious sinusitis was widely reported to have caused significant flock problems in growing poults and laying birds, which frequently necessitated culling of chronic cases on welfare grounds. Thirsk VIC noted that mixed mycoplasma and bacterial infections were usually identified.

### *Ostriches*

Ostrich farming was probably the most significant new development in commercial bird rearing in recent decades and 1995 saw numerous submissions of this species. The single biggest problem was impaction of the proventriculus and gizzard. Although indigestible fibrous vegetable matter was most frequently involved there were other cases where all manner of foreign bodies were involved and Sutton Bonington VIC reported kleptomania in an ostrich which had 37 nails and screws in the proventriculus and 31 nails, some of which were four inches in length, in the gizzard with a total weight of 2.7 kg..

The possibility of fowl plague or virulent avian influenza could not be eliminated during the post mortem examination of ostrich chicks at Luddington VIC. Nine out of 30, six to eight-week-old chicks, died suddenly and post mortem findings included conjunctivitis and marked congestion of the respiratory tract. Following investigations by the VO, samples were negative for viruses and restrictions on the flock were lifted. Although bacterial investigations revealed a mixed growth of organisms, *Pseudomonas aeruginosa* was a consistent finding and the use of fine sand as a bedding material may have been significant in causing the conjunctivitis.

### *Other birds*

Carbon monoxide poisoning was suspected by Thirsk VIC when five out of seven budgerigars died in a fifteen minute period in a domestic kitchen. As a result gas board officials apparently found an unsafe gas heater which was being used at the time of the deaths.

Polyomavirus infection was diagnosed in psittacine species at the Truro VI Unit. The case involved chicks that were being hand reared and although they were only ill for a few hours they all died over a period of a week. Although well known in the USA this condition has only once before been reported in the UK.

Malaria was diagnosed in an adult penguin by Sutton Bonington VIC with the demonstration of plasmodium parasites on blood smears. Post mortem lesions comprised of an enlarged spleen, which was extremely soft and friable, enlarged liver and congested and oedematous lungs. The plasmodium was identified as *Plasmodium relictum*, which is transmitted by either mosquitoes or biting flies.

### **Miscellaneous species**

#### *Equidae*

Penrith VIC investigated a syndrome of Fell ponies that had been recognised for several years, but which had never been investigated. Foals were well at birth and suckled, and then at about 10 to 14 days of age became slow, dull with variable symptoms of coughing, diarrhoea or ocular discharge. Despite therapy they either died or required euthanasia between 4

to six weeks of age. Investigations continue. Many of the pony breeders are owners of sheep farms in the less favoured areas and the sale of ponies makes a significant contribution to the farm economy of these areas.

#### Deer

Luddington VIC and Starcross VIC diagnosed tuberculosis, due to infection with *Mycobacterium avium*, in Red deer with lesions in the retropharyngeal lymph nodes.

Examination of an 11-month-old Red deer at Shrewsbury VIC revealed a pronounced protrusion of the scapulae dorsally, giving the animal a hump-back appearance. There was severe necrosis of the serratus ventralis musculature in the thoracic and cervical regions leading to rupture at the point of insertion with the scapula. The lesions were consistent with “flying scapula”, which has previously been described in cattle. Elsewhere there were sporadic reports of parasitic bronchitis and enzootic ataxia.

#### Goats

The number of caprine submissions was small, reflecting the continuing decline in commercial goat farming in most areas. Most of the problems were associated with parasitic gastroenteritis and clostridial enterotoxaemia in adult goats. There were sporadic reports of Johne’s disease in adults.

High mortality in adult goats in which acute pleuropneumonia was a feature at post mortem examinations carried out at Winchester VIC prompted a report to Animal Health colleagues of the suspicion of contagious caprine pleuropneumonia (CCPP). The unit had rapidly increased in size including the importation of goats from Northern Ireland, France and Belgium, although all had been on the premises for at least one month. CCPP was eliminated following further tests and *P. haemolytica* serotype A2 was isolated.

#### Rabbits

Viral haemorrhagic disease (VHD) continued to spread throughout the South West, Wales and as far north as Cumbria during 1995. Increasing interest in VHD, and its becoming a notifiable disease, resulted in an increase in carcase submissions and common diagnoses were *P. multocida* septicaemia, myxomatosis and coccidiosis.

#### Other mammals

Centres received a wide range of submissions for examination under the Wildlife Incident Investigation Scheme. Problems with metaldehyde slug bait were not infrequent in dogs. It is not often that dinosaurs feature in VIC monthly reports but one was responsible for the death of a springer spaniel in Cornwall. The dog was submitted as a suspected pesticide poisoning case, but on post mortem it was found to have an obstruction of the duodenum caused by the ingestion of a child’s plastic dinosaur.

Examination of stranded dolphins and porpoises at Truro VI Unit revealed injuries consistent with entrapment in fishing nets. The tissues of all marine mammals were cultured for brucella species with negative results. Although initial screening of serum from two dolphins was positive, confirmatory tests carried out at CVL proved negative.

#### Fish

Penrith VIC reported that the hot summer, low water levels and consequent low oxygen levels precipitated a multitude of bacterial, parasitic and other related problems in salmon, trout and a range of garden pond fish.

Acid fast bacilli were detected by Barton Hall VIC in large ulcerated areas on the head and lateral line of a tropical catfish. Appropriate advice was given regarding the zoonotic implications.



Langford VIC reported that spring viraemia of carp led to the closure of a number of angling waters in their area and that recent fish introductions were considered to be the source of infection.

## 1995 Disease Diagnosis (Vida II Returns)

*Table 2.3 The following is a tabulated summary of the main diagnoses recorded at Veterinary Investigation Centres in England, Scotland and Wales and not listed elsewhere in the report. Each entry represents the number of times a particular disease has been diagnosed during the year.*

	1991	1992	1993	1994	1995
<b>CATTLE</b>					
Acetonaemia	369	337	335	542	450
Hypocupraemia/Hypocuprosis	1,128	1,186	954	935	838
Salmonellosis due to <i>Salmonella dublin</i>	355	354	521	556	560
Salmonellosis due to <i>Salmonella typhimurium</i>	595	481	720	1,069	1,155
Johne's disease	399	328	451	507	755
Bovine virus diarrhoea syndrome	776	977	1,256	1,327	1,285
Fascioliasis	134	149	133	291	252
Infectious bovine rhinotracheitis	284	193	269	308	282
Malignant catarrhal fever	22	27	32	80	83
Parasitic pneumonia	111	116	226	196	140
Foetopathy due to <i>Leptospira</i>	681	693	496	602	447
Mastitis due to coagulase positive <i>Staphylococcus</i> sp.	1,012	943	980	1,045	1,398
Mastitis due to <i>Escherichia coli</i>	1,523	1,575	1,652	1,891	2,083
Mastitis due to <i>Streptococcus agalactiae</i>	365	259	305	340	344
Mastitis due to <i>Streptococcus uberis</i>	1,064	962	1,104	1,162	1,263
<b>SHEEP</b>					
Salmonellosis due to <i>Salmonella typhimurium</i>	44	33	32	64	76
<i>Clostridium perfringens</i> type B disease (Welchii)	48	38	47	37	51
<i>Clostridium perfringens</i> type D disease (Welchii)	333	226	202	208	319
Erysipelas	54	41	17	11	8
Listeriosis (other than Foetopathy)	245	190	159	199	140
Pasteurellosis due to <i>Pasteurella haemolytica</i>	792	553	344	417	494
Parasitic pneumonia	37	41	33	42	27
Border disease	39	21	26	36	21
Fascioliasis	48	42	65	106	54
Parasitic gastroenteritis - Nematodiriasis	116	93	101	212	88
Pulmonary adenomatosis/Jaagsiekte	49	52	43	42	39
Swayback	26	21	26	15	23
Contagious pustular dermatitis/Orf	70	68	55	68	50
Sheep scab	NR	37	165	227	255
<b>PIGS</b>					
Erysipelas (other than Foetopathy)	28	26	31	12	30
Salmonellosis due to <i>Salmonella typhimurium</i>	92	117	111	125	114
Blue Eared Pig Disease (PRRS)	NR	13	131	112	114
Enteric colibacillosis	1,106	1,000	766	664	569
Swine dysentery	229	163	81	99	101
Swine influenza	4	177	162	118	112
Streptococcal meningitis	170	151	133	132	115
Foetopathy due to <i>Leptospira</i>	34	41	44	36	19
Foetopathy due to Parvovirus	62	68	28	24	22
<b>BIRDS</b>					
Broiler ascites syndrome	137	95	87	93	87
Gumboro disease/Infectious bursal disease	186	156	83	45	50
Turkey rhinotracheitis	3	12	12	1	6
Marek's disease	48	54	71	50	45
Chlamydiosis	174	153	139	135	108
<b>GOATS</b>					
Clostridial disease not otherwise specified	43	40	13	14	9
Helminthiasis	108	93	8	4	12
Scrapie	12	6	1	1	3

NR = Not Recorded

## Further investigations at the Central Veterinary Laboratory (CVL), Weybridge

### **Cattle** *Bovine viral diarrhoea* (BVDV)

Field isolates associated with unusual clinical signs have been typed with a large panel of pestivirus monoclonal antibodies to look for antigenic markers of virulence, but no clear patterns have emerged. None of the isolates obtained appeared similar to the new antigenic variants (BVDV type II) that have recently emerged in North America and which are often associated with severe clinical disease. A BVDV type II isolate that was made in the UK in the 1980s was inoculated into calves, but failed to cause significant disease. This is consistent with other reports of low virulence of BVDV type II isolates. Genetic and antigenic analysis of a series of BVDV isolates, that had been passaged alternately between cattle and sheep, revealed a host-specific amino acid change in the major envelope glycoprotein of the virus. This was associated with a change in antigenicity. In tandem with site-directed mutagenesis studies, this finding will help to determine the location and conformation of sites critical for virus neutralization.

### *Chlamydia*

Sequential series of sera were obtained from a number of affected cattle from herds exhibiting either clinical signs of abortion, or abortion in association with additional symptoms such as reduction in milk yield and respiratory signs. The sera were obtained over a period of several weeks to months and examined by immunoblotting using purified elementary bodies of a bovine chlamydial abortion isolate as antigen. Sera of abortion-affected animals produced similar strong reactivity patterns, whereas sera of cattle affected by the respiratory disease and milk drop syndrome (i.e. suspected chlamydial infection) demonstrated weak reactivity to fewer antigens. In view of the strong bovine antibody response to the chlamydial lipopolysaccharide, a recombinant ELISA test using lipopolysaccharide may be of value in improving primary serodiagnosis of bovine chlamydial abortion. DNA sequencing studies of several chlamydial isolates have provided information for the development of improved tests for the genomic characterization of individual isolates at the serotype/species level. Improved culture techniques have also been developed in which the isolation and propagation of chlamydial agents from mammalian and avian tissues and faeces, and from previously grown egg stocks, are enhanced.

### *Mycoplasma*

*Mycoplasma canis* was identified in cattle for the first time in GB by the Central Veterinary Laboratory. This mycoplasma was isolated with *Haemophilus somnus* by Thirsk VI Centre from the lungs of a calf which had died from acute respiratory disease. *M. canis* has been isolated previously from pneumonic cattle in Canada and in the Netherlands. It is thought that *M. canis* may be transmitted to cattle by dogs licking milk from calves' noses after feeding. However, because of its widespread prevalence in pneumonic cattle in the Netherlands, this mycoplasma may be part of the bovine microbial flora. In the present British case, there was no close association with farm dogs from the time the calf was bought at 10-14 days old. Post-mortem and histopathological findings indicated that the main cause of disease in the calf was *H. somnus* but it is unclear whether *M. canis* played a secondary role in pathogenicity. Further epidemiological studies are required to establish the prevalence of *M. canis* in cattle in GB and its association with respiratory disease.



Investigations were carried out into the cause of death of a calf with acute respiratory disease. Pathology suggested contagious bovine pleuropneumonia (CBPP) caused by *M. mycoides subsp. mycoides* SC although there was no history of importation of cattle onto the farm. Lung tissues and pleural fluid were cultured at the CVL and Bury St. Edmunds VIC for mycoplasmas. The polymerase chain reaction (PCR) was carried out directly on pleural fluid and on DNA from tissues; results were negative, quickly ruling out the possibility of *M. mycoides subsp. mycoides* or closely related "exotic" mycoplasmas. The CVL isolated mycoplasmas from several of the tissues which were also PCR negative. These were identified as *M. bovis genitalium*. Pasteurella was considered to be the main cause of death with *M. bovis genitalium* probably exacerbating the condition. While *M. bovis genitalium* is more often associated with reproductive disorders and mastitis it has also been isolated from consolidated lungs from calves with respiratory disease. Detection of *Mycoplasma mycoides mycoides* in formalin fixed, paraffin embedded tissues has been hampered by a lack of specificity of available polyclonal antisera. To resolve this problem, a panel of monoclonal antibodies has been evaluated. The specificity and suitability of some of these for histopathological diagnosis of CBPP is currently being determined.

#### *Necrotic enteritis in calves*

Complete analysis of the histology of all the cases from an outbreak of necrotic enteritis in a beef herd in the South West has shown the presence of superficial and deep erosions in all parts of the upper respiratory and alimentary tracts. The lesions are probably caused by direct entry of *Fusobacterium spp.* rather than by septicaemia. Although a wide range of other secondary agents principally *P. haemolytica*, *A. pyogenes*, *E. coli* and *H. somnus* have been isolated together with *Aspergillus spp.*, there does not appear to be any underlying viral aetiology in this condition. The condition now appears to have disappeared on this farm, which was one of the few to be affected in sequential seasons. In most outbreaks only one or a few animals were affected in one season.

#### *Infectious bovine rhinotracheitis (IBR)*

The genes coding for the IBR viral glycoproteins C and D were cloned into baculovirus vectors and the antigenic activity of the recombinant protein products was evaluated by ELISA and immunoblotting. A small panel of sera, including European reference sera, was used to optimise the ELISA for antibody detection. Although moderately good responses were seen with positive sera, the test was not able to detect very weak positive reference sera. A further series of recombinants is now being assessed. The possibility was investigated of identifying subtypes of IBR virus by direct sequencing from amplified DNA produced by the PCR. The study focussed on the thymidine kinase gene and the proximal portion of the glycoprotein E gene. A high degree of DNA sequence conservation between different isolates was observed in both cases indicating that these two regions were not suitable for subtyping by this method.

#### *Digital dermatitis in cattle*

Investigations are proceeding to determine the aetiology of digital dermatitis, a condition which has emerged in recent years to become one of the most important cause of lameness in dairy cattle. Spirochaete organisms have been found in over 50% of samples taken from clinical cases and precise identification of these organisms by direct sequencing of 16S RNA genes is being attempted.

#### *Role of nutrition and housing*

CVL is collaborating in a 3-year project with ADAS Bridgets Dairy Research Centre and the Royal Veterinary College to study the aetiology of lameness and foot lesions in first lactation pedigree Holstein heifers. In year

one the effects of housing in straw yards or cubicles and of two diets which differed in their proportions of concentrate and forage were studied. Housing in cubicle yards was associated with more severe white line haemorrhages. Both cubicle housing and a high proportion of concentrate in the diet were independently associated with more severe sole haemorrhages. Heifers fed the high concentrate diet experienced more lameness.

#### *Special investigation* *SI 0006*

Problems in a dairy herd were reported following the importation of cattle from Holland and Germany (Howie and others, 1994, Veterinary Record, March 19th, 1994, p310). Reported were abortions, respiratory disease, widespread ringworm, mouth ulcers, and, following parturition, poor milk production accompanied by excessive weight loss in early lactation. High morbidity and mortality of young calves has also occurred. The involvement of a bovine lentivirus (bovine immunodeficiency-like virus – BIV) was suspected following early serological studies.

Two studies have been carried out at the CVL on cattle purchased from the affected herd. Study 1, which included a bull, nine cows and three yearling heifers, was from December 1994 to July 1995. The main aim was to investigate the possibility of BIV infection by serology, attempted virus isolation, PCR and reverse transcriptase assays on cultures derived from blood leucocytes, lymph node biopsies and tissue samples collected at necropsy. Feed intakes were within the expected range and there was marked improvement in condition of eight of the cows, the bull and three yearlings with daily weight gains of between 0.75 and 1.7 kg/day. One cow calved shortly after arriving at the CVL, when still in very poor condition. She produced approximately 15kg milk/day in early lactation but was euthanased due to her poor condition in March at which time she was apparently gaining body weight. Her calf was healthy and its growth rate to July was 1kg/day. The presence of BIV infection was not confirmed in any of the cattle. Post-mortem examinations of the bull and nine cows revealed a high incidence of foot lesions which included chronic laminitis. A consistent finding at post-mortem examination was a widespread enlargement of lymph nodes. Histopathologically there was a marked hyperplasia which was indicative of persistent antigenic stimulation.

Study 2 started in October 1995 and will finish in April 1996. Seven pregnant dry cows were calved at the CVL with the objectives of studying early lactation appetite, milk production, weight change and calf performance and viability. The cows will be post-mortemed to investigate further the possible presence of infectious disease. Feed intakes and milk production have been entirely satisfactory with peak yields to date in excess of 30 litres, achieved without excessive loss of weight. Feet were all pared shortly after arrival at the CVL and lameness has not been a problem, although the group has persistent mild interdigital dermatitis which is treated monthly. None of the calves has so far required treatment for disease and growth rates have been good. The study including post-mortem examinations will not be completed until April 1996.

#### **Sheep** *Brucella immunochemistry*

Development of immunohistochemical identification of *Brucella* in formalin fixed, paraffin embedded tissues has continued throughout the year. Monospecific antisera to *Brucella abortus* and *melitensis* have been evaluated on experimentally infected guinea pig and sheep tissues. Sheep have also been experimentally infected with marine mammal isolates of *Brucella sp.*, and a range of formalin fixed tissues collected. The optimised immunostaining technique will be used to determine the distribution of organisms throughout these tissues.



*A newly recognised  
encephalopathy of  
Swaledale lambs*

An unusual nervous disease has been recognised in lambs from three separate flocks of pedigree Swaledale sheep, two in Yorkshire and one in Cumbria. The lambs are normal at birth but become progressively duller, fail to suckle and develop nervous signs including whole body muscle spasms with prominent involvement of facial muscles. There is no response to antibiotic and fluid therapy. In four 10-14 day-old lambs, central nervous system (CNS) lesions were strikingly symmetrical and consistently involved dorsal olives, midbrain and thalamus, but in a three day-old lamb involved only tegmentum. Early lesions in the olives comprised astrocyte necrosis, vacuolation of neuropil and vascular and microglial activation with sparing of neurones, progressing to complete loss of astrocytes and gitter cell accumulation. Myelin vacuolation and astrocyte activation were prominent in adjacent parenchyma. Lesions were similar at other sites except neuronal necrosis was more frequent. No abnormalities were detected in skeletal muscle. The topography and character of the brain lesions are distinct from other lambhood encephalopathies, including clostridial epsilon intoxication. An inherited defect is the most likely cause.

*Anthelmintic Resistance*

Farms in southern England were monitored for signs of reduced efficacy to anthelmintics and three were selected that showed evidence of reversion from benzimidazole (BZ) resistance. Cultures of nematodes isolated from these farms were grown and levels of tolerance determined. Infective larvae from these cultures were used to contaminate pairs of parasite free paddocks at the CVL and to infect ewes and lambs that were turned out to graze them during the summer of 1995. Animals on one of the paired paddocks received regular BZ anthelmintic during the grazing season, the others received levamisole. Resistance levels were monitored throughout the grazing season in each of the paired paddocks. There was no evidence of reversion in any of the paddocks and in particular the levamisole treated animals maintained their levels of BZ resistance throughout the summer.

More suspected cases of levamisole resistance were reported but we were unable to validate any of them. There are no signs of resistance to the ivermectin class of anthelmintics.

*Influence of the dry  
summer on levels of  
parasitic gastro-enteritis in  
sheep (PGE)*

The drought-like conditions of the summer led to speculation that worms would not be a problem during 1995 because the free living stages would perish without the moisture needed to survive. With the life-cycle broken, sheep would enjoy a parasite-free autumn. To look at this unique situation four separate sheep farms in southern England were monitored for evidence of nematodes from the beginning of September until the end of November. Levels of larvae on the herbage were very low or non-existent at first, following the hot dry conditions of July and August, but soon began to rise with the mild wet conditions of September and October. Larval numbers remained at significant levels throughout November. This is a similar situation to the summers of '76 and '89 when PGE was also not a problem until the autumn. The dry spell reduced parasite exposure and the need to worm the sheep but may well have compromised the host immunity and resistance to parasitic burdens. The cycle was not broken and sufficient larvae were able to survive the drought and infect lambs at the end of the season.

*Sheep scab:Pyrethroid  
resistance*

Two isolates of the sheep scab mite (*Psoroptes ovis*), unaffected by the repeated on-farm use of a scab approved synthetic pyrethroid (SP) plunge dip formulation, were investigated. The mite isolates were geographically separated, one coming from the north of Scotland and the other from the south west of England. Controlled laboratory dipping trials, using the SP dip

(containing flumethrin) at the recommended scab rate of 44 ppm, failed to control both isolates. Flumethrin dipwash was only 20% effective against the english isolate and 47% effective against the scottish isolate.

The history of the english incident revealed that synthetic pyrethroid pour-on (backline) treatments were used at the first signs of clinical scab, with later flumethrin dippings (even at the higher dose of 66 ppm) failing to be effective. SP pour-ons are not effective against sheep scab and could have potentiated acaricidal resistance to the SP plunge dip.

The systemic injectable, ivermectin, at two injections seven days apart, was effective against both isolates in the laboratory and plunge dipping in the OP diazinon, was effective against the english isolate in the field. One other suspect SP resistant isolate (from Cumbria) is presently being investigated and two further cases of suspect SP resistance have been reported, but no material was available for further investigation at the CVL.

The relationships at the molecular level between the haemagglutinin genes of classical swine influenza H1N1 viruses (circulating in pigs in GB since 1986) and those of other H1N1 viruses isolated from birds, pigs and humans were established. These strains are most closely related to, but distinguishable from, classical swine H1N1 viruses circulating in North America and therefore distinct from strains of avian origin which were introduced to pigs in GB in 1992. Furthermore, we were able to detect significant antigenic change between early and late GB isolates, indicating that antigenic drift is occurring in these swine influenza viruses.

Further studies with an 'avian-like' H1N1 virus from pigs were undertaken at the molecular level on all eight gene segments. All of these segments originated from an avian influenza virus confirming the recent emergence of an H1N1 influenza virus in the UK whose genetic composition is very similar to those of strains circulating in pigs in continental Europe since 1979. Genetic characterisation of the haemagglutinin gene indicated that these viruses were introduced to pigs in GB in early 1992 from pigs in continental Europe. Molecular analyses of the genes encoding the major viral antigens of swine H1N1 virus supported previous serological characterisation. The haemagglutinin gene originated from a human influenza virus, whilst the neuraminidase gene was derived from an equine influenza virus. These results show that pigs can act as hosts for the emergence and persistence of novel reassorted strains of influenza A virus, the progenitors of which may subsequently disappear from their natural hosts.

The circulation of influenza viruses in the national pig population continued to be monitored by disease surveillance. A recently emerged H1N2 influenza virus was associated with further widely distributed outbreaks of swine respiratory disease. Antigenic characterisation studies suggest that the virus is partially derived from a human influenza virus circulating ten years ago in the human population. The appearance of the H1N2 virus in pigs may have implications for public health and provides further evidence for the pig as a 'mixing vessel' of influenza viruses, some of which may have the potential to infect humans.

Following a large number of reports from private practitioners of influenza virus substantially affecting reproductive performance, particularly in herds infected endemically, laboratory investigations indicated that influenza may be associated with transplacental infection. To investigate whether swine influenza virus can cross the placenta and infect the foetus and/or foetal

## **Pigs** *Swine influenza*



membranes, a collaborative study was done jointly with the IAH, Compton. Pregnant gilts were challenged with 'avian-like' swine H1N1 influenza virus (a prevalent strain in the national pig population associated with respiratory disease) at 70 days of gestation. Infected gilts were monitored clinically and blood samples were collected to evaluate the humoral antibody response. At 98 days of gestation the gilts were sacrificed and foetuses removed. Following gross pathological examination, materials were collected for histopathology and virology. After challenge, gilts were inappetent but otherwise clinically normal. Two foetuses from one gilt were oedematous with pleural and subcutaneous fluid, suggesting recent death. Laboratory examinations are in progress. To date, influenza antibodies have been detected in fetal fluids from five separate cases suggesting transplacental infection with influenza A virus. Whilst further work is required, this is the first laboratory report of influenza virus associated naturally with transplacental infection. The potential for transplacental infection with influenza virus is supported by the detection of a viraemia in acutely ill pigs in earlier studies done at the CVL and from recent epidemiological studies in humans.

#### *Eperythrozoon suis*

*Eperythrozoon suis* is a rickettsian blood parasite which has been found in association with anaemia, jaundice, ill-thrift and death in piglets, and with agalactia (milk loss) in sows in a number of pig herds. It is known that *E. suis* is more pathogenic in an animal that has been immunocompromised through surgical removal of the spleen. In an attempt to set up an experimental infection as a preliminary to the development of a diagnostic test, blood samples collected from infected pigs in the field were inoculated into splenectomised pigs. These animals failed to develop clinical disease, and *E. suis* could not be detected in blood samples. Subsequently, a number of piglets known to be infected with the parasite were purchased from affected farms and two of these animals were splenectomised shortly after arrival. Apart from a transient rise in body temperature these animals remained healthy.

In the USA, *Eperythrozoon suis* is a recognised cause of disease in pigs. As the next stage of our investigations, we will be comparing the GB and USA isolates of *E. suis* by initiating experimental infections and with the PCR diagnostic technique developed by the American workers. Such studies should highlight any strain differences between the two isolates.

#### *Dermatitis/glomerulo-nephropathy*

The syndrome of dermatitis/glomerulo-nephropathy has been recognised widely in pigs in England and Scotland. Many of the cases have discolouration of the skin (purple blotches), anaemic carcasses and have an elevated blood urea and creatinine level. The pathology is largely restricted to the kidney with occasionally fluid in the pleural and abdominal cavities. The kidneys are enlarged, pale and occasionally have haemorrhagic foci. Histologically, there is a necrotising vaculitis in the skin and in the kidney a severe diffuse necrotising and proliferating glomerulo-nephritis with a significant mononuclear cell interstitial inflammatory exudate. A variety of bacterial agents have been associated with the condition (including *E. coli*, streptococci and staphylococci and *A. pleuropneumoniae*) but as yet a definite cause has not been found.

### **Birds**

#### *Poultry*

An experiment was conducted to investigate whether Infectious Bursal Disease (IBD) virus can be vertically transmitted from infected hens to their progeny. Specific Antibody Negative (SAN) hens in lay were infected with

the 52/70 strain of virus and eggs were collected from two days after infection for 14 days. These were hatched and the chicks were reared for 21 days when they were blood sampled. Six-days-old SAN embryonated eggs were inoculated via the chorio-allantoic cavity with IBD virus 52/70, then incubated, hatched and reared. At 21 days of age, they were blood sampled. All the inoculated hens were blood sampled 21 days after infection. All sera were tested for the presence of IBD virus antibodies. None of the progeny chicks had antibodies to IBD at 21 days of age, whereas all the chicks hatched from the IBD inoculated eggs had antibodies when sampled at this time. By 21 days post infection, all the parent chickens had seroconverted. These results indicated that IBD virus is not vertically transmitted.

#### *Waterfowl*

##### *Clostridium botulinum*

The natural habitat of *Clostridium botulinum* is soil and the mud and decaying vegetation of ponds and lakes. The hot dry summer gave rise to suitable conditions for the growth of the organism and the production of the lethal toxin. A number of outbreaks of botulism in water fowl with associated high mortality received wide spread publicity and samples were submitted from nine such incidents of suspect botulism. All the suspect cases of botulinum intoxication were confirmed, eight of the outbreaks being caused by type C. No cases of botulism were diagnosed in other species during this period.



# Livestock Protection and Improvement

## Animal Health Schemes

*Entry to all the Schemes is voluntary and chargeable. In May the Minister announced that, following the recommendation of the Lebrecht review of the State Veterinary Service, the Cattle Health Scheme (except for the EBL programme) and the Sheep and Goat Health Scheme (except the Scrapie monitoring programme) should in future be operated by the private sector. Three bodies expressed an interest in operating each scheme. Independent panels of industry representatives selected one candidate for each scheme, to begin operating in April 1996. In response to strong representations from the pig industry, the Minister agreed that the pig schemes would continue to be operated by the State Veterinary Service and that the fees would not be increased for three years.*

### *Scheme membership (at 31 December 1995)*

Cattle	5,247	herds
Sheep and Goat	3,584	flocks and herds
Poultry	352	flocks and hatcheries
Pig	708	herds
Deer	17	herds

### Cattle Health Scheme

The Cattle Health Scheme provides registers of herds which are free from Enzootic Bovine Leukosis (EBL), Infectious Bovine Rhinotracheitis (IBR) or *Leptospira hardjo* (*L hardjo*) infection. Members undertake to test their herds to demonstrate that the disease is absent, and to manage their herds according to agreed guidelines in order to prevent the introduction of infection.

#### *EBL Attestation Programme*

Entry to the Cattle Health Scheme register of EBL Attested herds provides the leukosis-free status required for Community trade under EC Directive 64/432/EEC. Although the export of breeding cattle to other EC Member States was prevented by BSE, recruitment into the Scheme continued. By the end of the year, there were 4705 herds registered as EBL Attested, with a further 541 herds enrolled in the programme.

#### *IBR Monitoring Programme*

By the end of the year, there were 286 herds enrolled in the IBR Monitoring Programme, of which 246 had achieved IBR-free status. Once a herd has achieved that status, accidental re-introduction of infection is uncommon, provided that the Scheme procedures are followed. These require that animals of unknown status added to the herd are first isolated and tested with negative results.

#### *Leptospira hardjo Programme*

The *L hardjo* programme provides a register of herds free from all serological or other evidence of infection. In order to ensure that infection is not introduced, the member, his veterinary surgeon, and a Veterinary Officer of the State Veterinary Service (SVS) meet each year to agree a "management

plan” to take account of the individual features of the member’s farm. Although this programme is time consuming and expensive, it gives a high degree of confidence in the continued disease security of the farm.

## **Sheep and Goat Health Scheme**

### *Maedi-Visna accreditation Programme*

Membership of the Maedi-Visna caprine arthritis and encephalitis Accredited section of the Scheme fell slightly, reflecting the continued financial pressures within the sheep industry and uncertainty over the future of the Scheme. Although members realise the importance of freedom from this disease, many commercial flock owners remain unaware of the potential consequences of infection. At the end of the year, there were 3519 members of the Maedi-Visna caprine arthritis and encephalitis programme, of whom 3340 had achieved Accredited status.

### *Enzootic abortion of ewes monitoring Programme*

Membership of the Enzootic Abortion of Ewes (EAE) monitoring programme continued to decline. At the end of the year, membership stood at 77.

### *Scrapie monitoring Programme*

The Scrapie Monitoring option of the Scheme was introduced specifically to facilitate exports by meeting the scrapie requirements of Council Directive 91/68/EC. By the end of the year, 220 flocks and herds were registered as meeting the scrapie monitoring requirements of the Directive.

## **Pig Health Scheme**

### *Pig Assurance Scheme*

The Minister’s announcement in May was welcomed by the industry who now saw the opportunity for the scheme to develop along with other important initiatives after the period of uncertainty caused by the Lebrecht review. The Pig and Poultry Fair in May saw the release of new promotional material and it was hoped that the use of this would increase interest and be reflected in a rise in membership. A policy covering broken needles on farms was introduced. Other rule changes were finalised and the membership consulted on these matters towards the end of the year.

### *Breeding Category*

Although the membership of this scheme has fallen it is still seen as making a valuable contribution to a specific sector of the industry.

## **Poultry Health Scheme**

Overall scheme membership remained steady during the year.

Twelve laboratories were approved to undertake Mycoplasma testing within the Scheme and quality control assessment continued during the year.

## **Deer Health Scheme**

This is a voluntary tuberculosis attestation programme. Before a herd can be registered as Attested, the premises must be inspected and approved by a Veterinary Officer of the SVS, and the herd must then pass three successive comparative tuberculin tests at intervals of between four and 12 months. The testing is carried out at the owner’s expense by his private veterinary surgeon, who must be approved as a Local Veterinary Inspector (Deer) for the purpose. All test results must be scrutinised by the Divisional Veterinary Officer.

After registration as Attested, the herd is subjected to periodic testing – normally at intervals of two years, when the testing included all animals aged two years or more.

At the end of the year, there were 17 herds enrolled in the Scheme, all of whom were registered as Attested.



## Artificial insemination

The collection and processing of semen for use in artificial insemination (AI) is subject to statutory control. Semen may only be collected from bulls and boars which have undergone clinical examination and testing by a Ministry Veterinary Officer. Collection and supply of bovine semen is governed by the Artificial Insemination of Cattle (Animal Health) (England and Wales) Regulations 1985, as amended, and corresponding legislation in Scotland. These Regulations were amended in October to implement Directive 93/60/EEC, thereby allowing for the trade and use of fresh bovine semen. Production of porcine semen is governed by the Artificial Insemination of Pigs (England and Wales) Regulations 1964 and the corresponding Scottish regulations, and the Artificial Insemination of Pigs (EEC) Regulations 1992.

### *Bovine semen: Collection, processing and storage*

One processing centre closed during the course of 1995, reducing the total number of processing centres licensed to produce bovine semen for use in Great Britain to 13, of which 11 were also licensed to produce semen for intra-Community trade.

**Bulls presented for AI are tested for:** tuberculosis, brucellosis, infectious bovine rhinotracheitis/infectious pustular vulvovaginitis, enzootic bovine leukosis, bovine viral diarrhoea, trichomoniasis (*T. foetus*) and campylobacteriosis (*C. fetus*).

A total of 484 new bulls were approved for use in AI, of which 402 were in England, 61 in Scotland and 21 in Wales. Fourteen bulls were rejected.

All cattle at AI Centres are subject to annual inspection by Ministry Veterinary Officers at which time they are tested for brucellosis, tuberculosis and enzootic bovine leukosis. All animals passed these tests in 1995. All cattle were also tested for infectious bovine rhinotracheitis and those at EC-approved Centres were found to be seronegative. A number of seropositive bulls were kept at domestically approved Centres and collections of semen from these bulls continued to be routinely tested for the presence of the virus. Annual monitoring was also carried out on all active bulls for *Campylobacter fetus* infection with negative results.

There were 11 approved main stores in Great Britain in 1995.

### *Supply of semen*

In 1995, 18 new supply licences were granted to operate within existing zones for the delivery of semen to farm storage units and the provision of an insemination service, giving a total of 55 supply centres.

### *Semen shops and farm storage units*

Nine new semen shops were licensed in 1995 bringing the total to 37, of which 31 are in England, three in Scotland and three in Wales. At the end of 1995, 4715 farm storage licences had been granted for bovine semen in England, 905 in Scotland and 770 in Wales. This represents an increase of 4% above last year's total.

### *Porcine semen*

During 1995, one new Centre was licensed to collect semen within Great Britain and one Centre was closed. This gave a total of ten licensed pig AI Centres in Great Britain, six of which were approved to produce semen for intra-Community trade.

**Boars presented for AI are tested for:** tuberculosis, brucellosis and Aujeszky's disease. Boars destined for EC-approved AI Centres are also tested for classical swine fever and tested or treated for leptospirosis.

In 1995, a total of 626 boars were approved for use in AI; 41 were rejected.

All pigs at AI Centres passed the brucellosis and Aujeszky's disease tests to which they are subject at the annual inspection by Ministry Veterinary Officers.

#### **Embryo transfer** *Cattle*

The collection and transfer of bovine embryos was governed by The Bovine Embryo Collection and Transfer Regulations 1993 until October, when those Regulations were revoked and replaced by The Bovine Embryo (Collection, Production and Transfer) Regulations 1995. The new Regulations extended the scope of the 1993 Regulations to include all embryos (except those produced by the fusion of cell nuclei). All approvals under the 1993 Regulations were deemed to be approvals under the 1995 Regulations.

Twenty-seven teams are currently approved in the United Kingdom for both the collection and transfer of bovine embryos, two of which were approved in 1995. A further two teams are approved for transfer only, one of these approvals having been granted in 1995. There were no approved embryo production teams in 1995.

#### *Sheep and goats*

The Artificial Breeding of Sheep and Goats Regulations 1993, which implemented those parts of Directive 92/65/EEC governing intra-Community trade in ovine and caprine semen and embryos, were revoked and replaced in October by the Animals and Animal Products (Import and Export) Regulations 1995. Two semen collection teams were approved during 1995 and one embryo collection team giving a total of two semen and five embryo collection teams.



## Animal Welfare

*The State Veterinary Service (SVS) continued to monitor standards of animal welfare on farms, at markets, in transit and at slaughter. Agreement was reached by the EC Council of Ministers to a Directive setting out new rules on the protection of animals during transport. The review of the EC Directive on the protection of calves was expedited at the request of the UK. Veterinary supervision of new export routes continued following the decision of the major ferry companies to stop carrying live food animals. New Regulations were made implementing an EC Directive on the welfare of animals at slaughter. The Farm Animal Welfare Council (FAWC) published its Report on the Welfare of Turkeys and commenced a study on laying hens .*

### Welfare on farm

The SVS is responsible for the monitoring and enforcement of legislation covering on-farm welfare. It has concentrated its activities on follow-up action resulting from complaints and allegations about infringements of the legislation and on monitoring standards set by EC directives, including new requirements for battery cages which came fully into force on 1 January 1995.

During 1995, the SVS carried out 4711 welfare visits to farms specifically to inspect welfare standards. The welfare of animals was also assessed during the many farm visits made by the SVS for other purposes.

High priority is given to responding to complaints and allegations, the aim being to initiate appropriate action within 24 hours. One hundred and twenty seven prosecutions were initiated by the SVS in liaison with the police, local authorities, and other agencies including the RSPCA and SSPCA. In most cases, however, problems can be better resolved by giving advice and instructions. Further visits are then undertaken to ensure that these have been followed.

UK Ministers were successful in persuading the EC Commission to bring forward the review of the Directive on the protection of calves and have continued to press for a phasing out of the close confinement veal crate system throughout Europe. A new Council of Europe recommendation on the welfare of domestic fowl was adopted.

Divisional Welfare Liaison Groups throughout the country continued to work on issues relating to welfare on agricultural land, at markets, in transit and at slaughter. Publicity campaigns to promote specific aspects of good animal welfare practice have continued.

### Welfare in transit

This continued to be an important area of activity in 1995, reflecting the intensity of public concern and the continuing need to apply tight welfare controls to the various alternative export routes, which have been set up following the 1994 decision of the major ferry companies to stop carrying live food animals. The trade in live food animals continued to be closely monitored by the Ministry and each new route was thoroughly checked by Ministry staff before approval was given.

Details of pre-export inspections of horses and ponies are given in Table 4.1.

EC rules on the protection of animals during transport are set out in Directive 91/628/EEC. MAFF's most significant farm animal welfare achievement of 1995 was the agreement by the EC Council of Ministers, on 23 June, of Directive 95/29, amending the rules agreed in 1991. The UK was a prime participant in this prolonged negotiation, which produced Community-wide rules introducing maximum limits on the length of time livestock is allowed to travel, feeding and watering intervals and tough new enforcement mechanisms, including a system of licensing for transporters of livestock.

The Directive must be implemented by 31 December 1996. We issued a consultation paper in October 1995 setting out initial plans for applying the controls laid down by the Directive within a framework which will continue to allow livestock transporters to pursue their legitimate trade. Further consultation will take place and the UK will liaise closely with other Member States and the European Commission with the aim of ensuring that the agreed measures are effectively enforced across the Community.

*Table 4.1 Veterinary inspections and examinations for fitness to travel of horses and ponies for export.*

	Inspected	Examined	Rejected
Horses over 147cm	2,484	2	0
Ponies/equines 147cm or under/	1,650	0	2
Total	4,134	2	2

## Welfare at markets

The SVS continued to carry out welfare surveillance at markets in liaison with local authorities who enforce the Welfare of Animals at Markets Order 1990 (as amended) and the Welfare of Horses at Markets Order 1990.

## Welfare at slaughter

The Welfare of Animals (Slaughter or Killing) Regulations 1995 came into force on 1 April 1995, implementing an EC Directive (93/119/EC) and revoking existing GB legislation. The Regulations include detailed requirements for the movement, lairaging, restraint, stunning, and killing or slaughter of animals. New arrangements for the licensing of slaughtermen were implemented, which require both red meat and poultry slaughtermen to demonstrate competence before being granted a licence.

On 1 April 1995 the Meat Hygiene Service became responsible for the monitoring and enforcement of welfare legislation in licensed slaughterhouses, a role previously performed by local authorities. The SVS carries out these duties in unlicensed premises.

## Farm Animal Welfare Council

The Farm Animal Welfare Council (FAWC) is an independent, Government-appointed body which advises Ministers on the welfare of farm animals on agricultural land, at markets, in transit and at the place of slaughter. Officers of the SVS continued to advise and support the Council.

In January 1995, FAWC submitted a report to Agriculture Ministers on the welfare of turkeys. Studies continued on the welfare of farmed fish, pigs kept outdoors (both are due to be completed by Spring 1996) and dairy cattle. In addition, a review of the welfare of laying hens was begun as was consideration of recommendations, relevant to FAWC, made in the Report of the Committee to Consider the Ethical Implications of Emerging Technologies in the Breeding of Farm Animals (the Banner Committee). The Council issued a general newsletter about its work and a European newsletter containing information gathered from its counterparts in the EC.



## Consumer Protection

*The control of salmonella in poultry and animal feedingstuffs, a comprehensive programme of research on the epidemiology and control of other zoonotic organisms, particularly campylobacter, Escherichia coli 0157:H7, and monitoring and surveillance for medicinal and other residues in animal and animal products continued to be key elements in the Ministry's measures to safeguard public health during 1995.*

### **Salmonella in poultry** *Laying flocks*

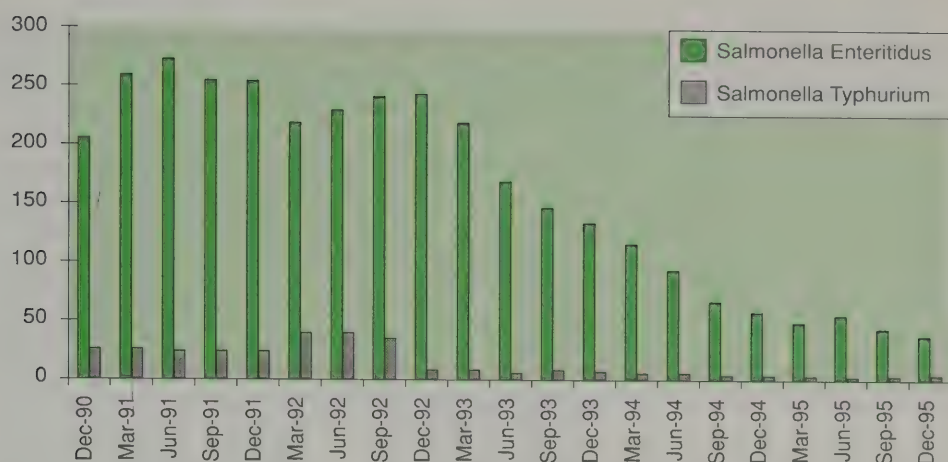
A Code of Practice for the Control of Salmonella in Commercial Egg Laying Flocks was prepared in consultation with industry and issued in 1995, to complement the one previously produced for breeding flocks and hatcheries. In addition, a Code of Practice for the Control and Prevention of Rodent Infestation in Poultry Flocks was prepared in recognition of the fact that rodents pose a number of problems including a threat to salmonella control.

### *Breeding flocks*

Directive 92/117/EEC lays down harmonised rules for the control of *Salmonella enteritidis* and *Salmonella typhimurium* in breeding flocks of domestic fowl throughout Member States. It has been implemented in Great Britain through the Poultry Breeding Flocks and Hatcheries Order 1993 and the Zoonoses Order 1989. The Directive also requires Member States to collect epidemiological information on certain zoonoses, including *Salmonella enteritidis* and *Salmonella typhimurium*, and submit an annual report to the Commission on the trends and sources of these infections. Our first report was submitted in 1995.

*Salmonella enteritidis* infection was confirmed in a single layer breeder flock in 1995.

Reported incidents of *Salmonella enteritidis* in broiler breeder flocks continued to decline (Figure 5.1). Statutory monitoring resulted in 36 reports of *Salmonella enteritidis* infection. Sixteen flocks were found not to be infected based on serological or bacteriological investigation. Seven flocks had been depopulated before an investigation could be carried out, but the premises were subject to official cleansing and disinfection. Of the flocks found to be infected, nine were compulsorily slaughtered, including four flocks where treatment with the antibiotic enrofloxacin, followed by competitive exclusion material, proved unsuccessful. Two flocks were successfully treated and in two cases the owners opted for treatment of the progeny with an antibiotic which was active against systemic infection. There were five incidents of *Salmonella typhimurium*, which is a small increase compared to the previous year. Infection was confirmed in two cases and the flocks were compulsorily slaughtered.



**Figure 5.1** *Salmonella* incidents in broiler breeders 1990-1995

## Salmonella in other food animals

Nominated Officers (Senior Veterinary Investigation Officers in England and Wales, Divisional Veterinary Officers in Scotland) investigate incidents of salmonella infection reported to them under the Zoonoses Order 1989. The action that they take is based on an assessment of the risks to animal and human health and is aimed at controlling the infection on the premises and protecting public health.

The salmonella serotypes most frequently reported from agricultural livestock between 1990 and 1995 are shown in Table 5.1.

**Table 5.1** *The Salmonella serotypes most frequently reported from cattle, sheep, pigs and birds 1990-1995*

Serotype	1990	1991	1992	1993	1994	1995
<i>S. enteritidis</i>	946	918	856	809	360	255
<i>S. typhimurium</i>	994	879	843	1222	1241	1548
<i>S. dublin</i>	546	484	461	689	633	367
<i>S. newport</i>	311	319	240	181	144	46
<i>S. seftenberg</i>	296	208	81	89	93	23
Totals (all serotypes including the above)	5048	4471	3730	4297	3606	3615

The steady decline in the number of incidents of *Salmonella enteritidis* reflects, mainly, the improving situation in poultry flocks. The number of incidents of most other serotypes has also declined although this has been balanced by a corresponding increase in the number of incidents of *Salmonella typhimurium*, making the total number of incidents very similar to the previous year. *Salmonella typhimurium* DT 104 was again the most predominant phage type of *Salmonella typhimurium* and was isolated most frequently from cattle, although it was also found in sheep, pigs and birds. The spread of the organism in cattle herds was the subject of a national case-control study over the year (reported below under “Research and Development”).

## Salmonella in animal feedingstuffs

In 1992, in response to a recommendation made by an expert Committee studying animal feedingstuffs, the Ministry asked laboratories to provide enhanced information on the results of monitoring for salmonella in animal feedingstuffs. The results of this monitoring are summarised in Table 5.2 which shows the large number of tests being performed on animal feedingstuffs as a result of Ministry/industry codes of practice for the control of salmonella. The results point to the fact that salmonella contamination rates are declining in most sectors of the feedingstuff industry and this is most welcome. The basis under which tests are reported on finished feedingstuffs was changed in 1995, allowing a comparison to be made between contamination rates in meals and extruded (pelleted) feeds. Not



surprisingly, this has revealed much lower contamination rates in extruded feeds, thereby supporting the value of extrusion as a means of reducing salmonella in feedingstuffs.

Table 5.2 Number of tests carried out and the overall salmonella contamination rates found in various types of feedingstuffs and raw ingredients during 1994 and 1995.

Product	No of tests		No of tests positive		Percentage positive	
	1995	1994	1995	1994	1995	1994
Processed animal protein at a protein processor in GB.	10341	10203	200	220	1.9	2.2
GB and imported processed animal protein arriving for feeding stuff use.	4548	6137	202	254	4.4	4.1
Linseed meal, rapeseed meal, soyabean meal and sunflower meal at a UK crushing premises.	1749	2709	48	127	2.7	4.7
All other tests on oilseed meals and products for feedingstuffs use.	13279	12460	459	616	3.5	4.9
Non-oilseed meal vegetable products	12560	14422	186	289	1.5	2.0
Pig and poultry meals	3826		107		2.8	
Poultry extrusions	4502		29		0.6	
Pig extrusions	1578		14		0.9	
Ruminant concentrates	2927	3235	81	111	2.8	3.4
Protein concentrates	1534	1724	114	64	7.4	3.7
Minerals/ Other	951	949	4	5	0.4	0.5

The number of isolations of *S. enteritidis* and *S. typhimurium* reported from animal feedingstuffs in the period 1992 to 1995 are shown in Table 5.3. No significant trends are apparent for either *S. enteritidis* or *S. typhimurium*, both of which are rarely isolated from animal feedingstuffs.

Table 5.3 The number of isolates of *Salmonella enteritidis* and *Salmonella typhimurium* reported from animal feedingstuffs 1992-1995

Type of material	1992		1993		1994		1995	
	Se	St	Se	St	Se	St	Se	St
Finished feeds	6	15	5	9	4	25	2	20
Animal protein	0	0	0	1	0	4	0	1
Vegetable material	2	8	7	15	1	6	4	10
Minerals	0	0	0	0	0	0	0	0
Miscellaneous	2	5	2	1	0	4	1	5
TOTALS	10	28	14	26	5	39	7	36

## Animal by-products

On 1 January 1993 the Animal By-Products Order 1992 came into force, implementing the provisions of Directive 90/667/EEC on the disposal and processing of animal waste. Under the Order, animal by-products have to be disposed of to specified outlets including approved or registered rendering, petfood, pharmaceutical or technical plants, or to knackers, hunt kennels and certain other outlets. They can also be buried or incinerated.

Rendering premises must register under the Processed Animal Protein Order 1989. This Order requires processors to submit samples of processed animal protein to an approved laboratory for salmonella testing on each day that product leaves their premises. If tests prove positive, no product may leave the premises for incorporation into animal or poultry feedingstuffs unless certain conditions specified in the Order are complied with. In addition, Ministry staff carry out quarterly inspections of all registered premises and sample 20 days' production for salmonella through the year. Table 5.4 shows how the microbiological status of processed animal protein has improved since 1989, with only 1.7% of the samples taken in the course of official testing during 1995 being contaminated with salmonella. The contamination rate was lower than in 1994 (when it was thought the slight increase in contamination rates compared with 1993 was due, in part, to the temporary

interference caused by plant alterations as a result of the new rendering conditions specified by Commission Decision 94/382/EC, and the consequences of a fire at a large rendering premises which caused a persistent contamination incident).

Table 5.4 Results of MAFF testing of home produced processed animal protein under the Processed Animal Protein Order 1989

	1989	1990	1991	1992	1993	1994	1995
No of samples tested	1674	1388	1360	1318	1274	1066	1041
No positive all serotypes	88	40	46	22	26	27	18
No of <i>S. enteritidis</i>	8	1	2	3	1	0	0
No of <i>S. typhimurium</i>	4	0	0	0	0	0	1
% of samples positive	5.3	2.9	3.3	1.7	2.0	2.5	1.7

The Importation of Processed Animal Protein Order 1981 prohibits the landing of processed animal protein into Great Britain except under licence. Samples taken by Ministry staff from consignments landed in Great Britain are tested for salmonella. In 1989, Agriculture Departments introduced more rigorous licensing conditions for the importation of animal and fish protein under the Importation of Processed Animal Protein Order 1981 (as amended). In 1995, Ministry staff found salmonella contamination in 44 of the 549 consignments (8.0%) of imported protein they tested. This compares favourably with 12.6% and 16.9% of the consignments sampled in 1993 and 1994 respectively. Table 5.5 outlines the test results.

Table 5.5 Results of MAFF testing of imported processed animal protein under the Importation of Processed Animal Protein Order 1981 (as amended)

	1989	1990	1991	1992	1993	1994	1995
No of consignments tested	623	588	616	581	404	514	549
No of consignments positive	239	166	129	68	51	87	44
No of <i>S. enteritidis</i>	2	3	0	0	0	0	0
No of <i>S. typhimurium</i>	8	3	1	0	0	4	0
% consignments positive	38.3	28.2	20.9	11.7	12.6	16.9	8.0

## Research and Development: Serological tests for *Salmonella*

In collaboration with scientists in Denmark and Switzerland, an ELISA based on the detection of SEF14 antibodies has been evaluated successfully for the serological detection of *Salmonella enteritidis* in chickens and *Salmonella dublin* in cattle. Further characterisation of the SEF14 fimbrial antigen by monoclonal and polyclonal antibodies has revealed three immunodominant peptides and these will be evaluated in assays for the rapid serological detection of *Salmonella enteritidis*. Western and dot blot tests using *Salmonella enteritidis* flagella and SEF14 fimbriae have been developed. These detected flagella and SEF14 antibodies in individual and pooled serum samples from an infected flock identified originally by the lipopolysaccharide (LPS) ELISA. These specific tests may have an application to confirm *Salmonella enteritidis* infection.

## *Salmonella* vaccines

The genetically-defined *Salmonella enteritidis* aroA vaccine candidate CVL30 generated good protection in commercial broiler breeder parents against a phage type 1 challenge strain originating from Hungary. This vaccine strain has good potential for field use against a broad spectrum of *Salmonella enteritidis* strains and in a variety of stock. The serological responses in chickens dosed with strain CVL30 and its wild type parent strain LA5 have been investigated. There was a marked difference in the responses to LPS, flagella and SEF14 fimbrial antigen. This may be a function of the inability of the vaccine strain to undergo sustained multiplication in the tissues.



*Pathogenesis of  
Salmonella enteritidis  
infection*

Previous studies showed that SEF14 fimbriae do not contribute significantly to the pathogenesis of *Salmonella enteritidis* infections in chickens. However, studies using a genetically defined *Salmonella enteritidis* sefA-strain that does not express SEF14, demonstrated that it was ingested more readily by human neutrophils than the parent strain expressing SEF14. This may indicate that the role of SEF14 and other fimbrial antigens is, in part, host specific. A number of other novel fimbrial – type structures have been identified on strains of *Salmonella enteritidis* and *Salmonella typhimurium*. These are being characterised and will be evaluated for their use as diagnostic antigens as well as investigating their role in pathogenesis.

*Case control study of  
Salmonella enteritidis  
in poultry breeding flocks*

Two hundred and seventy seven individual flocks were involved in the study. Nearly 90% of these were broiler breeders and the remainder were layer breeders. Phage type 4 was isolated from 95% of culture positive flock investigations so the study was both serotype and phage type specific. As expected, the age of the birds was positively associated with risk of *Salmonella enteritidis* and age was therefore treated as a confounder in the analysis. The most important measures identified by this study, that are likely to reduce the risk of *Salmonella enteritidis* PT 4 infection for poultry breeder flocks, are thorough cleansing and disinfection of sites following a salmonella incident, strict hygiene measures between the site and the hatchery, effective isolation of the poultry unit from other domestic species and the use of uncontaminated poultry feed. There was no evidence of vertical transmission of infection from grandparent flocks.

*Salmonella contamination,  
cleansing and disinfection  
studies*

Continuing laboratory studies of disinfectant activity showed the superior effect of formaldehyde and formaldehyde containing compound disinfectants against a range of salmonella serotypes. This was confirmed in field studies where formaldehyde fogging was very effective for disinfection of contaminated poultry houses even where prior cleansing was poor. Formaldehyde based products also produced long-term suppression of salmonella multiplication in the laboratory even when applied at sublethal concentrations, whereas many other disinfectants had no such suppressive effect. The addition of 15% homogenised egg to salmonella in solution before adding disinfectant raised the lethal concentration six-fold with some products. Studies on the persistence of *Salmonella enteritidis* on materials showed a rapid decline in contamination levels on clean concrete particles and steel and a more gradual reduction on wood and brick. Salmonella persisted at high levels on straw particles and on polypropylene for at least eight months. Field investigations of salmonella and coliform bacteria levels before and after cleansing and disinfection of poultry houses, showed that there was little relationship between the numbers of coliform and salmonella organisms persisting after disinfection. When disinfectant activity was poor there was often an increase in coliform counts after disinfection. Similar increases occurred with salmonella in some cases but in different sites. Mice infected with *Salmonella enteritidis* were found on many of the premises, and on two sites salmonella were isolated from cat faeces after disinfection of the premises had occurred. On one of these sites *Salmonella enteritidis* was found in a dead shrew brought into the house by cats. The use of diesel to dissolve tar oil disinfectants led to a poor reduction of salmonella in two premises due to inhibition of penetration of organic matter.

*Salmonella contamination  
of animal feeds*

On cereal farms where *Salmonella typhimurium* had been identified in cattle, a reduction in environmental contamination in cattle housing was accompanied by a reduction in the occurrence of cross-contamination of grain storage areas. The exception to this was where an infected mouse population had become established in the grain store. Isolates of other salmonella serotypes which were also detected in local wildlife, especially badgers, were

found from grain handling equipment suggesting contamination of cereals in the field. Other salmonella contamination hazards observed were swallow's nests situated above open cereal bins, infected mice dying in cereal heaps following an intensive baiting campaign, and use of mobile mill and mix systems which could cross-contaminate feed processed on subsequent farms.

*Epidemiology of  
Salmonella typhimurium  
DT104 in cattle*

Data collection for a national case control study to identify risk factors was completed late in 1995. Data have been collected from 696 case herds (infection was confirmed in approximately 80% of these herds) and 507 control herds and analysis is underway. Continuing longitudinal studies showed excretion of salmonella had stopped in all groups of cattle in which a full herd vaccination course had been completed. In contrast the organism was found in bulk faeces from adult cattle on all dairy farms where no vaccine had been used. On two farms the prevalence of positive samples increased following introduction of new susceptible animals to contaminated premises. There appeared to be poor environmental survival of the organism in unoccupied, but previously contaminated, areas. The prevalence of infection in fresh faeces samples from wild birds, badgers, mice, rats and particularly cats taken during the summer increased, even though there had been a reduction in contamination of cattle areas in most cases. Excretion by swallows was found and on two premises fresh swallow droppings were the only positive samples found after disappearance of infection in the cattle. Results from one farm sampled during heavy rain demonstrated widespread contamination of floodwater, surface water and distant watercourses following run-off from fields where infected cattle had been held previously.

*Epidemiology of  
Salmonella  
typhimurium  
DT104 in pigs*

Field studies of infected pig units showed a low prevalence of infection in adult breeding stock areas which did not appear to increase significantly in farrowing accommodation. There was, however, a massive increase in contamination of weaner housing with bulked faeces from most batches of pigs being positive. There was some reduction in the prevalence of infected batches of pigs by pork or bacon weight. As with cattle units, involvement of wild birds, mice, rats and cats was common. Limited sampling carried out after cleansing and disinfection of pig pens suggested substantial survival of salmonella, particularly in weaner accommodation. There was, however, less cross-contamination of grain and feed stores than was found on cattle farms.

*Epidemiology of  
campylobacter in chickens*

A longitudinal study of 100 broiler flocks over an entire production cycle has been carried out. Data collection is complete and analysis underway.

*Sub-typing of  
campylobacters  
for epidemiological studies*

The RFLP/PCR scheme has been applied to over 700 poultry isolates. All poultry isolates were typable using this scheme whereas about 20% of strains were untypable using previous standard serotyping methods. In one study of 135 isolates from 15 geographically separated broiler houses, eight distinct RFLP/PCR types were recognised. Isolates from the majority of flocks had a single RFLP/PCR type suggesting a single point source of infection. In comparison, serotyping indicated a greater diversity of strains, suggesting that antigenic variation can occur within genotypically related strains and give conflicting results for veterinary epidemiological investigations. The molecular typing technique has also been applied to 182 isolates from two unrelated municipal sewage plants and waste water from a poultry abattoir connected to one of the sewage plants. Twenty two RFLP/PCR types were identified. The distribution indicated that the strains found in poultry were also detectable in waste water from solely domestic and human sources. However some strains were unique to known poultry related sources while others were unique to human waste. These results suggest (i) there are avian-specific strains and (ii) the potential importance of non-poultry sources of human infection.



*Pathogenesis of  
Campylobacter jejuni  
infection*

The quantitative model of campylobacter colonisation of chickens developed at the Central Veterinary Laboratory has been used in collaborative studies to investigate the role of a variety of bacterial factors, using genetically modified mutants. These studies have shown that, in addition to flagella, the enzyme superoxide mutase is critical for optimal colonisation. Preliminary studies indicate that immunity associated with prior infection with *Campylobacter jejuni* can protect from subsequent challenge. This suggests that vaccination is potentially a realistic control strategy.

*Quinolone resistance in  
campylobacter*

One hundred and twenty-three avian isolates of *Campylobacter jejuni* were examined for enrofloxacin, norfloxacin and nalidixic acid. Three of the isolates showed resistance to enrofloxacin. The figures for norfloxacin and nalidixic acid were four and three respectively. These results highlight the importance of continued monitoring for quinolone resistance in *Campylobacter jejuni* strains isolated from poultry.

*Escherichia coli 0157  
infections in cattle*

A survey of beef carcasses in abattoirs in the U.K. was carried out in order to estimate the prevalence of contamination with *Escherichia coli* 0157:H7. Contamination was confirmed in 0.47% (95% confidence limits: 0.22 - 1.00%) of neck skin samples. A significant tendency for carcasses from the same abattoir on the same day to have similar results was detected. A survey of bovine faeces samples routinely submitted to Veterinary Investigation Centres in England and Wales found *Escherichia coli* 0157:H7 in 0.86% of 6495 samples. No association with season or herd type (beef or dairy) could be found. There was some evidence that the prevalence may be higher among calves under six months old. Three dry cows were infected with  $10^{10}$  *Escherichia coli* O157:H7 and intermittent excretion ranged from 14 to 44 days. When three lactating cows were similarly infected, the excretion was for much shorter periods, despite the cows receiving two further challenge doses. None of the animals showed signs of illness. *Escherichia coli* O157 was not isolated from the milk and none of the cows showed a serological response. Of the different *Escherichia coli* O157 detection techniques used, immunomagnetic separation was the most sensitive and could detect two organisms per g faeces.

*Escherichia coli and other  
VTEC*

Monoclonal antibodies to the verocytotoxins have been used to develop a latex agglutination test which is now being evaluated. Cell adhesion studies have commenced and many of the VTEC isolates adhere to Hep2 cells.

**Potential food safety  
incidents**

The Veterinary Investigation (VI) Service until the end of September, and thereafter the VI Division of the Veterinary Laboratories Agency, continued to investigate and advise in incidents involving the exposure of food animals to toxic chemicals. One hundred and three incidents were investigated and a potential risk to the food chain was identified in 72 of these. This was a reduction of 25 cases (26%) compared with 1994, when there were 117 incidents of which 97 posed a potential risk to the food chain.

*Table 5.6 Potential food safety incidents investigated by the VI Service*

Toxin involved	Species involved	Number of incidents			
		1992	1993	1994	1995
Lead	Bovine	64	56	76	56
	Ovine	2	4	1	3
	Ducks & Geese	2	3	1	0
Copper	Bovine	3	1	1	1
	Ovine	16	21	6	2
	Porcine	0	0	0	0
Ionophores	Bovine	2	0	0	0
	Ovine	0	0	0	0
	Avian (Turkeys)	3	7	2	3
Arsenic	Bovine	1	0	0	4
	Ovine	1	1	0	0
Metaldehyde	Bovine	1	0	1	0
	Porcine	0	0	1	0
Other	All species	6	4	8	3
TOTAL	All species	101	97	97	72

### *Lead poisoning*

There was a significant reduction in the number of reported incidents of lead poisoning during 1995. Most of the cases occurred in housed calves and were associated with access to lead paint. Many dairy herds have insufficient calf facilities, especially at peak calving time, and there is the tendency to use a number of materials, especially old doors covered in lead based paint, to create additional calf pens.

Several VICs reported incidents of lead poisoning in young cattle shortly after they had been turned out. A typical case was described by Barton Hall VIC when, shortly after a group of seven-month-old store cattle had been moved to a field adjacent to housing, two died and three others exhibited the typical signs of lead poisoning; blindness, aimless wandering, bellowing and grinding teeth. The source of contamination was a rusty tin of putty which had been carelessly discarded in the field. Winchester VIC described an incident that arose after a battery had been heard to explode, scattering portions of casing and inner parts over a wide area to which calves eventually gained access.

One incident, which was investigated by Newcastle VIC, occurred as a direct consequence of the drought. Following the death of one suckler calf and the development of nervous signs in another, biochemical examination of blood samples revealed elevated lead concentrations. The source of contamination was identified as flaking paint on a water tank which had recently been brought into the field as the normal water supply had become exhausted.

In all the incidents a period of voluntary movement restriction was agreed with the owner in order to protect the food chain.

### *Copper poisoning*

Copper poisoning was diagnosed by Barton Hall VIC following the death of 14 four month old lambs in a flock of 600 which had been given two copper oxide needle boluses. They had received their first bolus when three weeks old and the second one, five weeks later. The owner had received independent advice the previous year that consecutive boluses could be used to improve fleece quality. Appropriate steps were taken to protect the human food chain.

### *Arsenic poisoning*

There were three reported incidents of arsenic poisoning, each of which was associated with access to tanalising material containing copper chrome arsenate. The first of these attracted considerable attention from the local media. It occurred when arsenic poisoning was diagnosed at the Truro VI Unit following the death of one animal from a group of 11 yearling cattle. These had been high arsenic concentrations. Prompt action was taken to protect the human food chain and the local authority sealed off the site.



Arsenic poisoning was diagnosed by Starcross VIC when a faecal sample from an 18-month-old steer that had shown severe abdominal pain, salivation and inco-ordination of sudden onset, was found to have very high levels of arsenic. There were two possible sources of contamination. Firstly, the field had just been fenced with tanalised wooden posts to which the stock had access. Secondly, there is a history of mining in the area and arsenical contamination of the surrounding soil was widespread. Recent repairs to a boundary wall had resulted in considerable disturbance of the soil and analysis of sub-soil samples revealed arsenic levels of 16,000 parts per million. The animals were moved out of the field and a period of movement restriction was agreed in order to protect the food chain.

A similar diagnosis was made by Shrewsbury VIC following the death of a five-month-old suckler calf. The veterinary surgeon's post-mortem examination revealed intense inflammation throughout the alimentary tract and analysis of liver tissue demonstrated an elevated arsenic concentration. A farm visit revealed that a group of animals had broken through a fence into an adjacent timber treatment plant where they had contact with copper chrome arsenate. A period of movement restriction was agreed with the owner in order to protect the food chain and appropriate repairs were carried out to the fencing.

#### *Mercury poisoning*

Mercury poisoning was diagnosed by Langford VIC in a group of 38 dairy replacements. The source of the mercury was a bag of suspected seed dressing which was thought to have been inadvertently introduced within a purchased round bale of straw. One animal went into convulsions and others became hyperaesthetic within an hour of introduction. One died the following day and post-mortem examination revealed an haemorrhagic abomasitis, pulmonary oedema and haemorrhage, excess bloodstained pericardial fluid and diffuse hepatic necrosis. High levels of mercury were confirmed in the suspected seed dressing and a period of voluntary movement restriction was agreed with the owner in order to protect the human food chain.

#### *Organophosphorus poisoning*

Organophosphorus poisoning was diagnosed by Winchester VIC, as the cause of death of four out of 70 steers that had exhibited typical clinical signs. Investigations revealed that an insecticide intended for use with potato drills had been spilt onto the pasture. Two weeks later the group of steers were moved to the pasture and gained access to the material. Appropriate steps were taken to protect the food chain.

#### *Milk taint*

Several incidents of milk taint were referred to centres for investigation in the autumn. In each case the milk purchaser had taken the necessary steps to prevent the milk entering the food chain: One problem was referred to Barton Hall for further investigation in early October after milk direct from some cows was found to have a distinctive chemical taste. The milk purchaser had become aware of the situation some ten days earlier and they had rejected a silo of 100,000 litres of milk as it was suspected of having been contaminated. Regular testing was carried out for some time and the milk purchaser continued to reject the milk.

There were anecdotal reports from elsewhere that milk had been rejected due to taint and it was suggested that the feeding of poorly fermented silage may have been wholly or partially responsible.

#### *Salinomycin Toxicity*

Salinomycin toxicity was diagnosed by Luddington VIC in a group of 12 to 15 week-old turkeys. The birds developed diarrhoea and several died.

Investigations revealed that the turkey ration had been replaced by a broiler grower ration, containing salinomycin, during the three days prior to the onset of clinical signs. No further cases were seen following the withdrawal of the broiler ration.

## **Meat Hygiene**

### *Poultry meat*

The Poultry Meat, Farmed Game, Bird Meat and Rabbit Meat (Hygiene and Inspection) Regulations 1995 came into force on 1 April, replacing the 1994 Regulations of the same name which implemented the EC Poultry Meat Directive (92/116/EEC) and those parts of EC Directive 91/495/EEC applying to rabbit and farmed feathered game meat. As with the previous Regulations they apply to any premises slaughtering more than 10,000 birds or rabbits a year. The purpose of the 1995 Regulations was to transfer enforcement responsibility from local authorities to Agriculture Ministers acting through the Meat Hygiene Service (MHS).

Throughout the year, regular visits were made to licensed white meat slaughterhouses and cutting premises to advise and monitor compliance with existing legislation. At the end of 1995, 144 slaughterhouses in England were licensed to operate under the Regulations, together with 68 cutting plants, four cold stores and one re-wrapping centre.

In Scotland there were eight licensed slaughterhouses, one cutting plant and one re-wrapping centre, whilst in Wales 11 slaughterhouses were licensed along with seven cutting premises and one cold store.

### *Fresh meat*

The Fresh Meat (Hygiene and Inspection) Regulations 1995 came into operation on 1 April 1995 to replace the Fresh Meat (Hygiene and Inspection) Regulations 1992 which implemented EC Directive 91/497/EEC on hygiene and inspection of fresh meat in slaughterhouses, cutting plants and cold stores. The main purpose of the 1995 Regulations was to transfer enforcement responsibility from local authorities to Agriculture Ministers acting through the Meat Hygiene Service (MHS). The Regulations also made some changes designed to reduce compliance costs, such as exempting cold stores which handle only packaged meat and changes to the requirements on timing of ante-mortem inspection and stamping of meat. They did not impose new burdens on industry.

The 1995 Regulations were amended with effect from 1 January 1996 to implement amendments to EC Directive 91/497/EEC adopted in June 1995, which benefit small slaughterhouses.

At the end of 1995, there were a total of 402 slaughterhouses in England licensed to operate under the Fresh Meat (Hygiene and Inspection) Regulations 1995, together with 357 cutting plants, 242 cold stores and 57 farmed game handling/processing facilities. In Scotland there were 48 licensed slaughterhouses, 41 cutting premises, seven farmed game handling/processing facilities and 44 cold stores; in Wales there were 36 licensed slaughterhouses, 25 cutting plants, 18 cold stores and six farmed game handling/processing facilities.

A number of red meat premises were still operating under temporary derogations from some of the structural requirements of the Regulations, while they completed the upgrading of their premises. All temporary derogations had been due to expire on 31 December 1995. However, an amendment to EC Directive 91/497/EEC allowed limited flexibility for Member States to grant extensions in individual cases where operators had begun to bring their premises into compliance with the structural



requirements, but could not complete the work by the deadline for reasons not attributable to them. Agriculture Ministers considered applications for extensions to the 31 December deadline against these criteria.

#### *Inspection visits*

All licensed premises were subject to regular visits by Ministry veterinary staff to monitor continued compliance with the licensing requirements of the Regulations. Visits during the latter half of the year were concentrated on plants operating under temporary derogation to check on progress with regard to their work plans.

#### *Wild game*

The Wild Game Meat (Hygiene and Inspection) Regulations 1995 came into operation on 20 September 1995, giving effect, in part, to EC Directive 92/45/EEC on hygiene and inspection of wild game meat intended for sale for human consumption. The Regulations apply new hygiene and inspection requirements to the production of wild game meat which is intended for consignment, or for sale for consignment, to a relevant European Economic Area State. Such meat must be processed in premises licensed under the Regulations.

Licensing inspection visits were undertaken from September onwards and at the end of 1995, 16 wild game processing facilities in England and 13 in Scotland had been licensed to operate under the Wild Game Meat (Hygiene and Inspection) Regulations 1995.

#### *Meat Hygiene Service*

The Meat Hygiene Service (MHS) was established on 1 April as an Executive Agency of the Ministry of Agriculture, Fisheries and Food (MAFF) to take over from local authorities the responsibility for enforcing hygiene, inspection and welfare requirements in red and white meat premises in Great Britain. The decision to establish the MHS was taken in response to long-standing requests of a majority of representative organisations in the meat industry, who had criticised the uneven standards and varying costs of the service operated by local authorities. The MHS also provides the unified inspection service long sought by the EC and third countries.

In order to ensure that the MHS operated consistently, an Operations Manual was produced covering all aspects of the MHS's responsibilities and specialised Hygiene Advice Teams made up of MHS and SVS staff audited standards and staffing levels in slaughterhouses.

#### *Meat products, minced meat and meat preparations*

The Meat Products (Hygiene) Regulations 1994 took effect from 1 January 1995. They implement the single market meat products Directive (92/5/EC) which introduced common hygiene standards throughout the EC for trade in meat products and certain other products of animal origin, and which has been applied on an administrative basis in Great Britain since 1 January 1993. Enforcement and supervision in the majority of meat products premises rests with food authorities.

At the end of 1995, there were 574 approved manufacturing premises in England, together with five meat products cold stores and 12 ambient stores. In Scotland, 49 manufacturing premises had been approved, whilst in Wales, 25 manufacturing premises were approved.

#### *Minced meat and meat preparations*

The Minced Meat and Meat Preparations (Hygiene) Regulations 1995 were laid before Parliament in December 1995 and will take effect from 1 January 1996. The Regulations implement the new Single Market Minced Meat and Meat Preparations Directive 94/65/EC, which introduces common hygiene standards throughout the EC and supersedes EC Directive 88/657/EEC.

Enforcement and supervision will be carried out by local environmental health officers except in premises that are also licensed under the fresh meat or poultry meat regulations for which supervision and enforcement will be carried out by the Meat Hygiene Service.

Veterinary inspection visits were made to premises involved in exporting minced meat and meat preparations to EC countries in accordance with the intra-Community trade requirements of EC Directive 88/657/EEC. Visits were also made to premises exporting meat products, minced meat and meat preparations to certain non-EC countries.

#### *Meat Hygiene Appeals Tribunal*

The Tribunal considers appeals where the appropriate Minister has refused to issue an operator's licence under the Fresh Meat (Hygiene and Inspection) Regulations 1995 or the Poultry Meat, Farmed Game, Bird Meat and Rabbit Meat (Hygiene and Inspection) Regulations 1995. It also considers appeals where such licences have been revoked. In 1995, six operators (five red and one poultry meat) submitted appeals to the Tribunal and nine remained from 1994. Of these 15 appeals, eight were subsequently withdrawn, six were heard (the Minister's decision was upheld in four cases) and one remained to be heard.

#### **Residues Surveillance**

The UK has in place a National Sampling and Surveillance Scheme (NSS) designed to monitor whether veterinary medicines are passing into meat for human consumption from cattle, pigs, sheep and goats in unacceptable concentrations. This programme is managed and co-ordinated by the Veterinary Medicines Directorate (VMD) and was established in fulfilment of the UK's obligations under Council Directive 86/469/EEC. The Directive sets out detailed rules requiring Member States to carry out large scale random sampling on-farms and in slaughterhouses to look for a wide range of veterinary products.

In April 1995 the Meat Hygiene Service (MHS), took over the collection of slaughterhouse samples from the State Veterinary Service (SVS). The SVS remain responsible for collecting samples from live cattle on farms as well as follow-up action on positives detected in the NSS. Follow-up action is taken on all samples which on confirmatory analysis show concentrations of a prohibited or an unauthorised substance or where a residue of an authorised substance exceeding the concentration laid down in the Animals, Meat and Meat Products (Examination for Residues and Maximum Residue Limits) Regulations 1991, as amended.

Where the presence of a prohibited or unauthorised substance has been confirmed a thorough on-farm investigation is undertaken by a veterinary officer accompanied by an investigation officer of MAFF's Legal Branch. This involves stock inspection and secondary sampling. If clear evidence of abuse is found the farmer is prosecuted. For authorised substances farmers are visited and advised of the steps that need to be taken to avoid residues of veterinary medicines entering the food chain. The farmer's veterinary surgeon is involved in these discussions. However, where this type of follow-up visit indicates a serious shortcoming consideration is given to prosecution.

In GB approximately 44,000 samples were taken and examined in 1995. The results published in VMD's Medicines Act Veterinary Information Service (MAVIS) covering the period January 1995 to the end of November 1995 indicate that the number of positive results found is low. No evidence of the use of illegal hormones, synthetic steroids or clenbuterol has been found.



Low levels of antimicrobial compounds continue to occur. Those present were identified as chlortetracycline, oxytetracycline, sulphadimidine and streptomycin. The incidence of sulphonamide residues above the maximum residue limit (MRL) in pig kidney samples was 1.4% compared with 1.7% in 1994. Full details of the UK's results will be published in the VMD's Annual Report on Residue Surveillance for Veterinary Residues.

Surveillance of veterinary medicine residues in poultry meat is carried out by the SVS to satisfy the residue testing requirements of Council Directive 92/116/EEC that amends and updates Directive 71/118/EEC. It also satisfies the export requirements for third countries. The MHS operating at licensed slaughterhouses in GB collect samples which are analysed for veterinary medicines and contaminants. Any samples found with residues of substances above the MRL are traced and the farm of origin visited by a veterinary officer to ascertain the cause of the residue. No positives were found in 1995.

Following an enquiry into the implementation of residue surveillance in each Member State under Directive 86/469/EEC the European Commission proposed, in 1993, a package of measures including new legislation, which is intended to assist Member States in preventing the illegal use of hormones and beta agonists and controlling the improper use of authorised veterinary medicinal products. As currently drafted these measures include proposals to continue the existing ban on the use of hormonal growth promoters and extend this ban to beta-agonists. They would also extend the existing surveillance on red meat, to poultry and aquaculture products and, in addition, would require individual Member States to submit to the Commission annually their national plans for monitoring milk, eggs, wild and farmed game and honey for the presence of veterinary residues.

Discussions on these proposals have taken place, in Council Working Groups in Brussels under the Belgian, German and French Presidencies but have not been pursued further, because the Agreement on Sanitary and Phytosanitary Measures, reached as part of the GATT Uruguay Round settlement, raised the possibility of a challenge by the USA on the grounds that the existing ban on the import of meat and meat products derived from animals treated with hormones constitutes an unjustifiable barrier to trade.

Against this background and the continuing public debate on the illegal use of hormones and the abuse of beta-agonists for growth promoting purposes within the European Community, the Commission held an independent scientific conference at the end of November 1995, with the aim of developing a solid and objective basis for future Community policy in this area. The initial conclusions reached by the conference confirmed that there was no evidence of a human health risk arising from the use of natural or synthetic hormones (trenbolone and zeranol) when used in accordance with prescribed conditions. The full conclusions of the conference will be presented to the Commission early in 1996 and, in the light of these, the Commission will present its own conclusions to the European Parliament and the Council of Ministers.

## Exports and Imports

*Austria, Finland and Sweden acceded to the European Community.*

*The Commission of the European Community began equivalence discussions with third countries under the new framework of the World Trade Organisation.*

*Newcastle disease outbreaks occurred in Belgium, Denmark, Germany, Italy, Luxembourg, Netherlands, Portugal and Sweden. Classical swine fever outbreaks continued but at lower levels in Germany and Italy.*

*Checks on imported animals did not reveal the introduction of serious exotic diseases. Post import checks did detect equine viral arteritis in stallions imported from Canada and Latvia.*

*Exports of calves and sheep were maintained around 1994 levels, and exports of breeding pigs and horses to the European Community and third countries were increased.*

*Cattle imports dropped by a third compared with 1994.*

### European Community Single Market

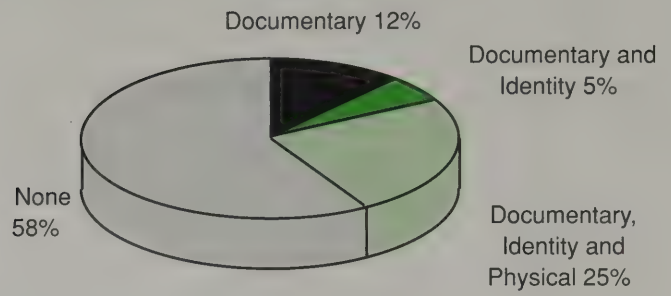
On 1 January 1995, Austria, Finland and Sweden acceded to the European Community and their territories became part of the Single Market. Imports and exports of live animals and genetic material to and from the three new Member States became subject to harmonised Community rules, although some additional guarantees and transitional measures were put in place temporarily to safeguard their animal and public health status. This meant that the required animal health export certificates for trade with the acceding countries were revised by the Ministry. Nevertheless, the conditions of entry meant improved commercial opportunities for United Kingdom exporters.

Revisions of Community Single Market rules for trade in livestock and germplasm were implemented by the Animals and Animal Products (Import and Export) Regulation 1995. Random checks and checks on consignments considered to be a risk are made at place of destination. To assist in targetting these checks all ANIMO messages were entered into a computerised risk management system (ARMS) which identifies consignments coming from areas of the Community subject to restrictions on movements of animals or animal products due to outbreaks of notifiable diseases. It demonstrated that as expected no animals were imported from such areas of the Community.

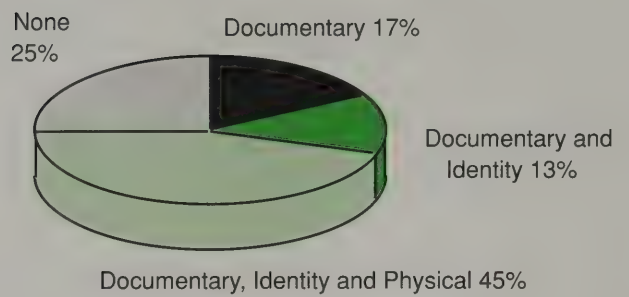
Figure 6.1 provides details of checks carried out on animals at places of destination. The types of check are split into documentary, where the health certification is checked, documentary and identity, where the identification markings on the animals are also checked, and documentary, identity and physical, where the animals are inspected and/or tested for signs of disease. Portal surveillance checks indicated that only a very few of the consignments entering or leaving Great Britain had inadequate health certification.



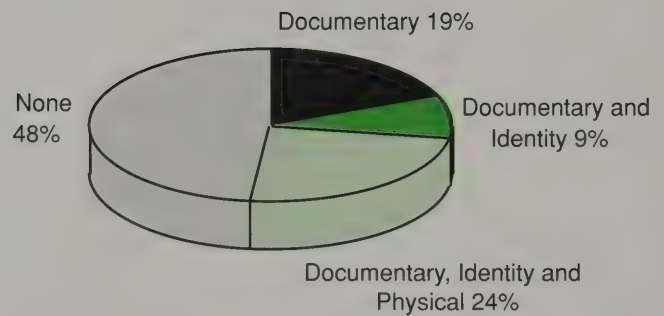
#### FARM LIVESTOCK AND OTHER MAMMALS



#### HATCHING EGGS



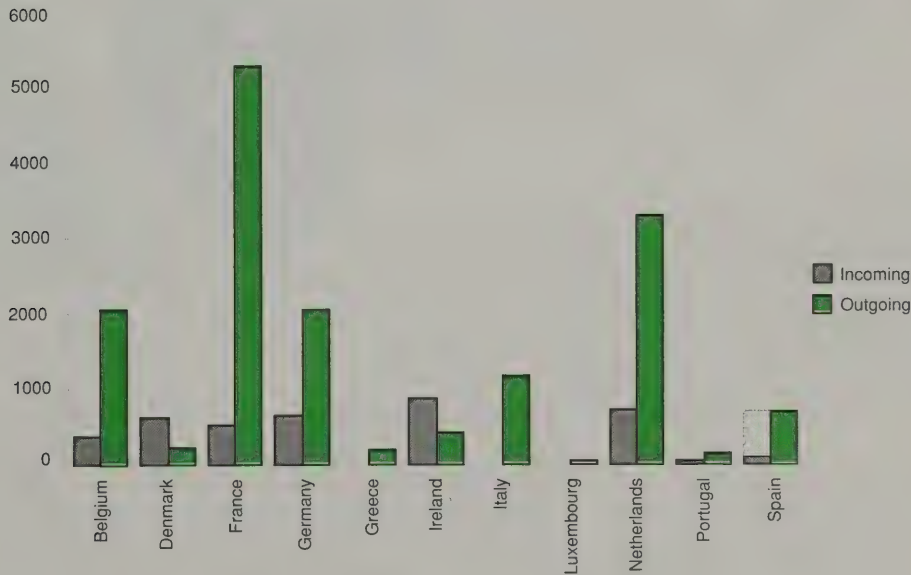
#### BIRDS



**Figure 6.1** Summary of Veterinary Checks at Place of Destination

Figure 6.2 shows the number of incoming and outgoing messages on the ANIMO (Animal Movement) computer system, which is a Community wide system allowing for advance notification of animal movements between Member States. Further development of ANIMO commenced in 1995 to widen the scope of the system to allow the transmission of messages relating to animal products as well as live animals. Additionally, the ANIMO message was expanded to allow transmission of information to help check the welfare of animals during transport, such as the place and expected date and time of departure of the consignment, and the Member States of transit. The system was expanded to allow the sending of messages to points of exit from the E.C. in the case of third country exports and to include new Member States of Austria, Finland and Sweden.

Despite the continuing “Don’t Import Disease” campaign which informs importers of their obligation to notify in advance their local Animal Health Divisional Office of their intention to import live animals, only just over half of the consignments were preceded by importer notification. Regular importers sent notifications but many first time importers were not aware of the requirement.



**Figure 6.2** Number of ANIMO messages sent and received

*Veterinary checks*

Community single market rules continued to be implemented via the Products of Animal Origin (Import and Export) Regulations 1992. Trade is largely subject to control at the place of origin to ensure that only products complying with Community rules are placed on the market. The Regulations also provide, in accordance with Directive 89/662/EEC, for some official checks at the destination and place certain duties on consignees to ensure that animal products comply with the relevant public and animal health import conditions.



Table 6.1 Exports of animals to other EC Member States 1991-1995

	1991	1992	1993	1994	1995
Cattle	399,893	428,056	497,890	518,072	469,916
Sheep	881,933	1,414,501	947,873	1,098,736	1,070,546
Goats	443	199	577	57	215
Pigs	305,972	403,213	111,062	66,448	77,543
Horses	5,828	5,382	9,816	4,539	5,696

Note: Due to the removal of frontier posts from 1 January 1993, the numbers of live animals exported was based on the ANIMO messages sent to other Member States and are not directly comparable with data for previous years.

## Livestock: Cattle

Exports of calves to other Member States fell by 9% compared with 1994. The majority were exported to France, Belgium and the Netherlands, with small numbers exported to Ireland, Italy and Spain, see figure 6.3. The number of cattle exported to Northern Ireland increased by 36% compared with 1994, largely due to an increase in the number of cattle exported for meat production.

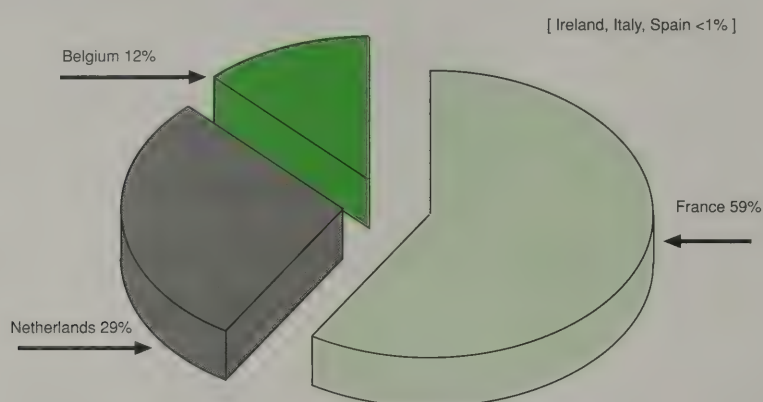


Figure 6.3 Exports of cattle to other Member States

A mission from the European Commission examined the implementation of Commission Decision 94/474/EC relating to the bovine spongiform encephalopathy (BSE) status of calves exported from GB and were satisfied with the procedures in place to check cattle from Great Britain.

In order to reduce the burden of paperwork, the declarations required for calves entering markets and collection centres were reviewed and the declarations and the requirements of the Bovine Animals (Records Identification and Movement) Order 1995 were incorporated into a single document. The computer system for checking the identification of cattle for export was enhanced to improve its resilience and to link it with the ear tag allocation computer system.

Procedures were also introduced for the re-export of cattle and sheep imported temporarily from other Member States to attend agricultural shows.

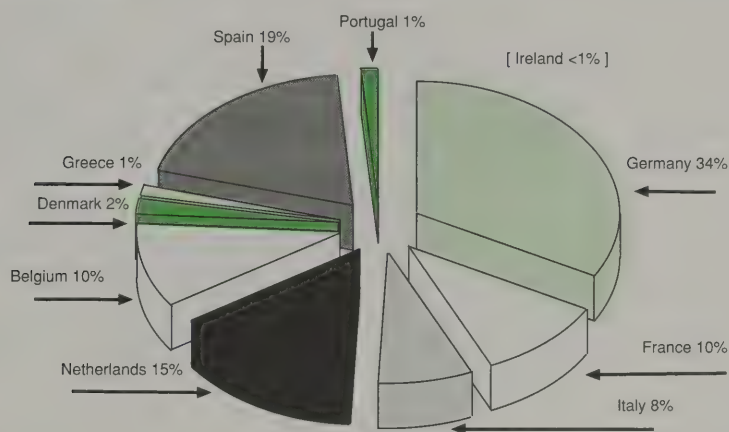
Council Directive 95/25/EC amended Directive 64/432/EEC and introduced a derogation from the tuberculosis and brucellosis testing requirements in the case of cattle, aged less than 30 months and intended for meat production which come from an officially tuberculosis and brucellosis free herd and bear a special mark.

Commission Decision 95/109/EC allowed Austria and Sweden to require additional guarantees for infectious bovine rhinotracheitis. Sweden was

permitted to continue to apply national rules with respect to paratuberculosis, leptospirosis, campylobacteriosis and trichomoniasis. Both Finland and Sweden tested animals after import for salmonellosis pending the outcome of deliberations on their national schemes by the Commission.

## Pigs

There was an overall increase of 16% in the number of pigs exported to other Member States compared with 1994. Germany and Spain were the major markets, followed by Belgium, Netherlands and France (see Figure 6.4). Ninety eight per cent of the pigs sent to other Member States were exported for breeding, although a small number of consignments of slaughter pigs were also exported.

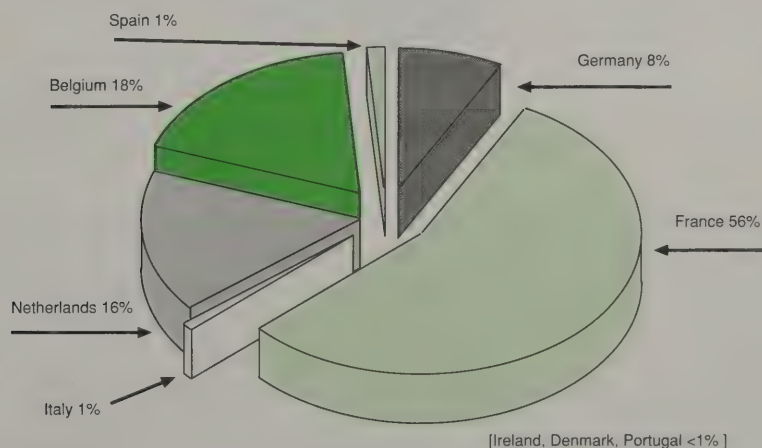


**Figure 6.4** Exports of pigs to other Member States

Supplementary certification concerning porcine reproductive and respiratory syndrome (PRRS) and transmissible gastroenteritis (TGE) was agreed for pigs exported to the Republic of Ireland. Additional guarantees were granted to Sweden with respect to PRRS and to Finland with respect to Aujeszky's disease. Sweden also continued with national rules for TGE, leptospirosis and porcine epidemic diarrhoea, pending consideration by the Commission of the European Community deliberations on additional guarantees.

## Sheep and goats

Sheep exports were 2.6 % lower than in 1994, at a level of just over one million animals. The major market was France, with significant trade also to Belgium, the Netherlands and to Germany (see Figure 6.5.). Exports of goats remained low with 215 animals sent to other Member States for breeding.



**Figure 6.5** Exports of sheep to other Member States



The European Commission is considering Swedish disease control programmes for paratuberculosis and contagious agalactia and pending its decision, Sweden may apply national import rules in respect of these diseases.

*Deer and zoo animals*

Trade in deer and zoo animals continued to be covered by Directive 92/65/EEC. As the Commission has not laid down protocols for tuberculosis testing of ungulates, national rules continued to apply. Deer exports were maintained at about 1600 animals. Two thirds were exported to France, Belgium and the Republic of Ireland, with smaller numbers to Spain, Portugal and the Netherlands.

*Cats, dogs, primates*

Rationalisation of export health certification for dogs and cats and other rabies susceptible mammals has continued with the issue of all export health certificates being devolved from Headquarters to Animal Health Divisional Offices. To simplify procedures, a review of the Notes for Exporters and Notes for Guidance for Local Veterinary Inspectors resulted in their amalgamation. New export health regulations for dogs travelling to Australia require freedom from antibodies to canine ehrlichiosis as determined by the Indirect Fluorescent Antibody Test (IFAT) and the Veterinary Laboratories Agency made available the test for *E. canis* antibodies, based on antigen prepared from infected monocytes grown in cell culture.

The implementation of Council Directive 92/65/EC in respect of rabies susceptible animals was consolidated. Difficulties were experienced in Intra-Community trade in primates as some Member States had not incorporated this Directive into their national legislation. Holdings of origin from which primates are to be exported must be registered with MAFF thereby enabling the supervising Veterinary Surgeon to provide a suitable export health certificate for a particular consignment. Whilst Directive 92/65/EC covers commercial consignments bilateral conditions continued to apply for pet animals.

*Live equidae*

Under the tripartite agreement between the United Kingdom, the Republic of Ireland and France, registered equidae continued to move without certification but non-registered equidae to France require certification. Over 5,000 horses were certified to the Member States, principally to France, Belgium, Germany, Italy and Spain. Random portal surveillance exercises detected six exporters attempting to export horses to other Member States without possessing the necessary export health certificates.

**Semen**

Over 31,000 doses of bovine semen were exported, principally to the Republic of Ireland with small amounts to the Netherlands, Spain, Germany, France and Belgium. Just over 1,000 doses of porcine semen were exported mainly to France with smaller quantities to Denmark, Spain and Germany.

Decisions 95/388/EC and 95/307/EC introduced model certificates for intra-Community trade in ovine semen and equine semen. Small quantities of both equine and ovine semen were exported to the Republic of Ireland.

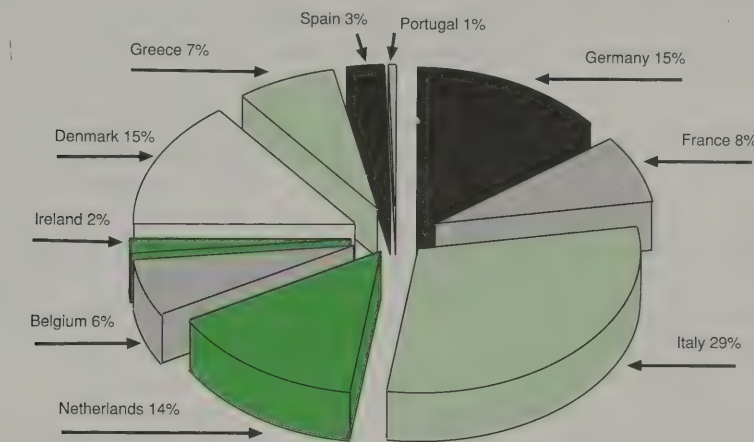
**Embryos**

Bovine embryos may be exported to other Member States under the provisions of Council Directive 89/556/EEC (as amended) and Commission Decision 92/290/EEC (regarding protection measures in respect of BSE). Embryos were exported to Northern Ireland, the Republic of Ireland and Denmark. Approval of ovine and caprine embryo collection teams and collection centres, required under Council Directive 92/65/EEC, was brought into the provisions of the Animals and Animal Products (Import and Export) Regulations 1995.

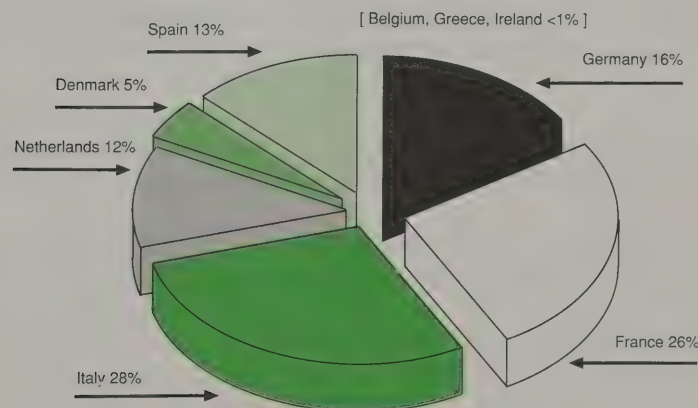
**Poultry, birds  
and hatching eggs**

Exports continued under the poultry trade directive 90/539/EEC, which was amended by 93/120/EC. This allowed a longer time scale for flock inspection in the case of hatching eggs for export; reduced the level of salmonella testing required for ‘lots of under 20’ from testing of the flock to individual testing of the birds for export and provided new conditions for consignments of poultry intended for the re-stocking of wild game.

Some six and a half million poultry were exported principally as day-old chicks (see Figure 6.6). Ten and a half million hatching eggs were exported principally to Germany, France, Italy and the Netherlands (see Figure 6.7).



*Figure 6.6 Exports of poultry to other Member States*



*Figure 6.7 Exports of hatching eggs to other Member States*

Implementation of Directive 90/539/EEC, for the export of non-domesticated species of poultry e.g. ornamental waterfowl and pheasants, etc. continued to cause problems due to the extensive systems of management commonly practised in such establishments.

Exports of non-psittacines from registered premises continued under Directive 92/65/EEC, based on an owner’s declaration. Export of psittacines remained subject to official veterinary certification while pet birds continued to be traded by bilateral agreement.



## **Animal products**

The Ministry's headquarters issued some 8,176 certificates for the export of animal products to other Member States (in addition to those issued from local Animal Health Offices).

The accession of Austria, Finland and Sweden to the European Community on 1 January 1995 followed the EEA Agreement which came into effect on 1 July 1994. This provided for trade in animal products with EFTA signatories to the Agreement (principally Norway, Sweden, Finland and Austria) and laid down conditions which are, in most cases, in accordance with the animal and public health rules governing intra-Community trade.

The implementation of the Wild Game Meat (Hygiene and Inspection) Regulations 1995 (SI 1995/2148) which came into effect on 20 September 1995, provided for harmonised rules for the export of wild game from licensed wild game processing facilities operating under the supervision of an OVS. This dispensed with the need for official veterinary health certification for intra-Community trade to EC Member States and Norway for game meat in all cases, except for carcasses of large wild game exported in skin to processing plants and for consignments that originate from an area subject to health restrictions or where transit via a third country is involved.

### *Export to Third Countries*

#### **Livestock, semen and embryos**

*Cattle, bovine embryos and semen*

With the continuing decline in the number of cases of bovine spongiform encephalopathy, negotiations continue with the aim of reaching agreement on export health certification, particularly for bovine embryos and semen, on the basis of the recommendations in the Office International des Epizooties Animal Health Code. Hungary was added to the list of third countries to which live cattle may be exported, which also includes the Czech Republic, Grenada, Morocco, Uganda and Zimbabwe.

Revised certification was agreed for the export of bovine embryos to Canada and negotiations continued for the export of bovine embryos to Brazil, the Republic of South Africa and Poland.

New certification was agreed for the export of bovine semen to Estonia, and revised certification was agreed for exports to Canada, New Zealand, the Republic of South Africa and Indonesia. Discussions began on certification with Jamaica, Mexico, Paraguay, Turkey and Uruguay.

#### *Pigs and porcine semen*

There continues to be a considerable export trade in pigs to countries outside the European Community. The principal destinations included Brazil, Canada, the Czech Republic, Korea, Poland and the United States of America.

New certification was agreed for the export of pigs to Croatia, Latvia, Slovenia, the Republic of South Africa and Vietnam. Revised certificates were also agreed with Argentina, Canada, China, Cyprus, Czech Republic, Ghana, Taiwan and the United States of America.

Certification was agreed for exporting frozen and fresh semen to United States of America and work began on protocols for exporting frozen semen to New Zealand and fresh semen to the Republic of South Africa. There were discussions on the certification for porcine semen with the Russian Federation and Poland.

*Sheep, goats and ovine  
/caprine germplasm*

New certification was agreed for the export of goats to Chile. Revised certification was agreed for the export of sheep and goats to the Isle of Man, Malta, Kenya and Saudi Arabia, for sheep to Hungary and for goats to Cyprus. Revised certification was agreed for the export of sheep and goat embryos to Canada.

Certification was agreed with New Zealand for the export of ovine semen.

*Deer, cervine embryos  
and semen and zoo animals*

Agreement was reached with the United States Department of Agriculture on certification for the export of cervine embryos and animals semen. New certification was agreed for the export of cervine embryos to Canada and revised certification for live deer, cervine embryos and cervine semen was agreed with New Zealand which recognised herd status under the Deer Health Scheme.

Certification was agreed for the export of deer to Hungary and Malta and for llamas to Israel.

**Poultry, birds and  
hatching eggs**

Great Britain continued to command a prominent role in the supply of grandparent poultry stock to third countries. A total of 10 new and 14 revised certificates were prepared for this trade and day old chickens, turkey poults and ducklings were exported world-wide. The ban on the export of poultry from within Newcastle disease infected areas in Member States curtailed exports from these countries, resulting in grandparent/parent stock for export to third countries being sourced from flocks in Great Britain which remained free from Newcastle disease.

New certification was agreed for the export of duck hatching eggs and certificates for the export of ostriches and penguins to New Zealand were agreed after prolonged negotiations. Three consignments of ostriches and one shipment of penguins were exported. A total of 5 new and 7 revised certificates were prepared for this trade in birds.

**Equines and equine  
germplasm**

The export trade in horses continued to steadily increase particularly to Turkey, Saudi Arabia, the Middle East, India and the Pacific Basin.

Commission Decision 95/99/EC revised the rules for temporary export of horses taking part in the 1996 Olympic Games in Atlanta, USA.

A total of 26 equine semen consignments have been exported during the year and includes consignments to Australia, New Zealand, the United States of America and the Republic of South Africa.

**Animal products**

The Ministry's headquarters issued some 10,709 certificates for the export of animal products to third countries (in addition to those issued from local Animal Health Offices).

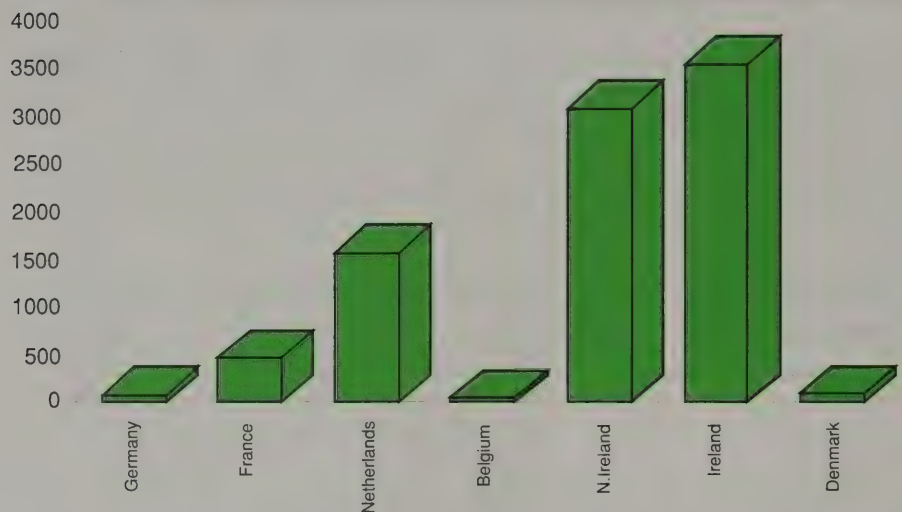
During the year approximately 100 new veterinary health certificates were drawn up for various new markets. Negotiations with the veterinary authorities led to new certificates and new market opportunities for: dairy products to Brazil; petfood and bovine meat to Cyprus; boneless beef to Egypt; meat, milk and dairy products to Lebanon; animal feed to Estonia; meat of bovine, porcine, ovine and caprine origin to Hungary; fresh meat to Indonesia; milk and milk products to Kazakhstan and meat to Sri Lanka.



## Imports – Intra Community Trade

### Livestock Cattle

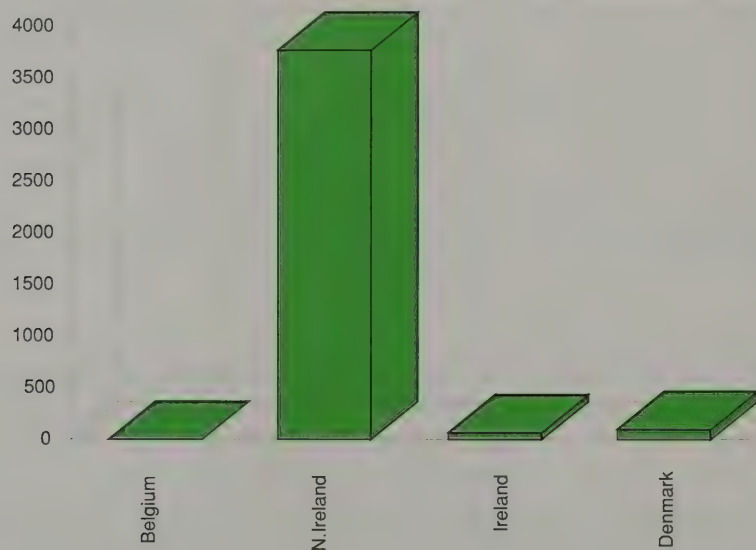
Some 8,900 cattle were imported into Great Britain, two thirds of which were for breeding. The majority were imported from Northern Ireland and the Republic of Ireland with significant numbers also from the Netherlands and France and a few consignments from Germany, Belgium and Denmark (see Figure 6.8). Random post-import checks found one animal imported from France to be infested with warbles, it was re-exported.



**Figure 6.8** Imports of cattle from other Member States and Northern Ireland

### Pigs

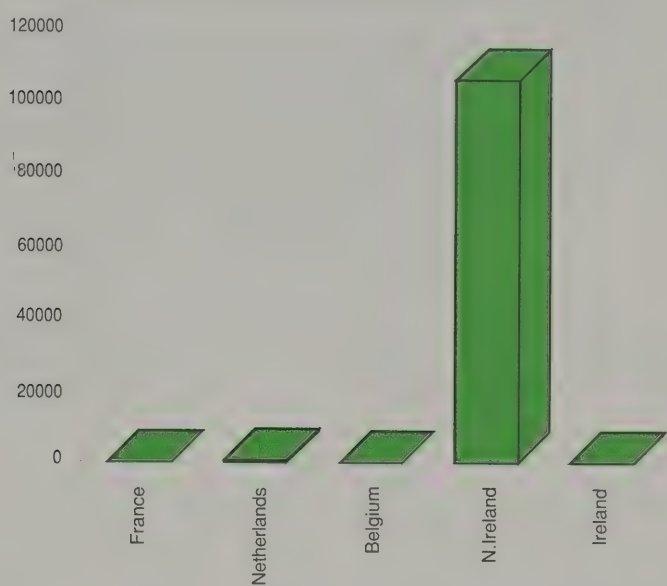
Two hundred and thirty three pigs were imported for breeding or production from Northern Ireland, the Republic of Ireland, Denmark and Belgium (see Figure 6.9). Some 3,700 pigs were imported for immediate slaughter from Northern Ireland. Community rules were changed to reflect the lifting of restrictions due to African swine fever in Spain and restrictions due to classical swine fever in Germany.



**Figure 6.9** Imports of pigs from other Member States and Northern Ireland

Sheep

The numbers of sheep imported into Great Britain increased significantly by 60% in 1995 to reach 106,395 (see Figure 6.10). Some 61% were imported for immediate slaughter, 28% for breeding and 10% for further fattening from Northern Ireland. Imports from other Member States fell by 74% during 1995 with consignments being imported from Belgium, France, Germany, the Republic of Ireland and the Netherlands.



**Figure 6.10** Imports of sheep from other Member States of the European Union and Northern Ireland

Goats

Over 500 goats were imported, being 57% less than 1994. Most came from Northern Ireland for slaughter. Two consignments of goats from France were found at post-import inspection to have evidence of Johne’s disease, caprine arthritis encephalitis and caseous lymphadenitis. The importer opted to have them slaughtered rather than returned to France.

Ungulates

Some 63 deer and 172 other animals of several species were imported mainly from zoological collections in other Member States of the European Community and Northern Ireland. As detailed rules for the application of pre-export tests required by Council Directive 92/65/EEC were not laid down by the Commission, Great Britain maintained its existing import requirements for tuberculosis.

Equidae

Thirteen consignments from Member States involving 46 horses were placed under restrictions post-import due to identification and documentation irregularities. One animal imported from Denmark had transit fever.

Semen, ova and embryos

Council Directive 92/65/EEC, setting out the outlines of protocols for trade in the semen, ova and embryos of ovines, caprines, equines and the ova and embryos of swine, was amended during 1995 by several Commission Decisions. Commission Decision 95/307/EC determines the format of the model health certificate for trade in equine semen, and Commission Decision 95/294/EC determines the format of the model health certificate for trade in equine ova and embryos, both Decisions being effective from 1 October 1995. Commission Decision 95/388/EC laid down the format of a model health certificate for trade in the semen, ova and embryos of ovine and caprine animals and applies from 1 January 1996.

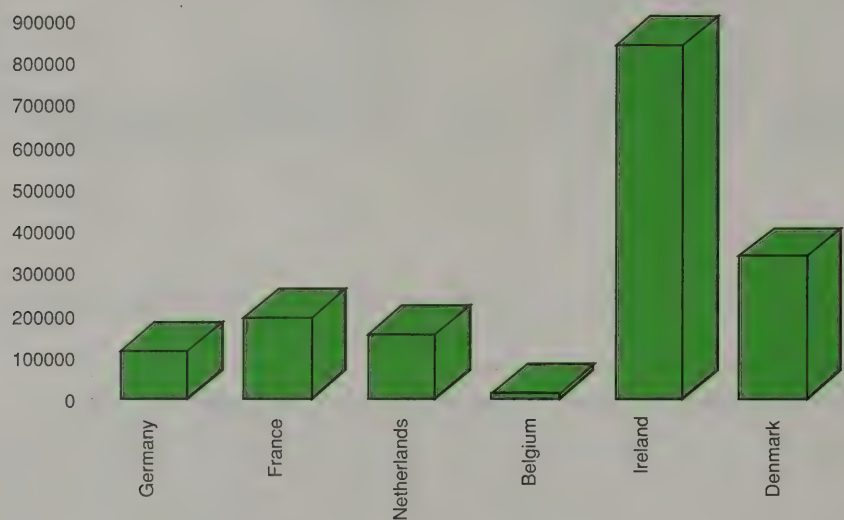


Five hundred and fifty four doses of porcine semen were imported from Germany under the rules set out in Council Directive 90/429/EEC.

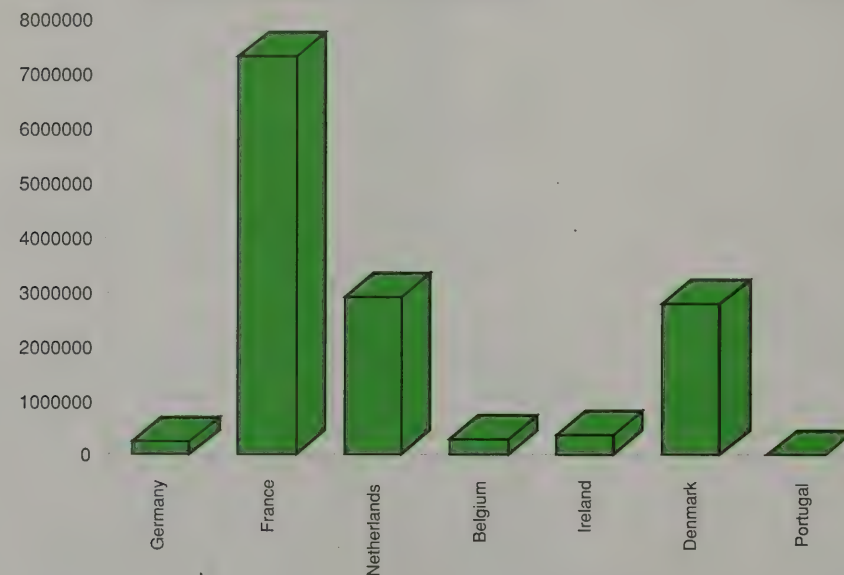
A quarter of a million straws of bovine semen were imported from Belgium, Denmark, France, Germany, Ireland and the Netherlands. Six hundred and fifty seven embryos were imported mainly from France with small numbers from the Benelux countries and Northern Ireland.

**Poultry**

Several Member States experienced a significant number of outbreaks of Newcastle disease in 1995, mainly in backyard flocks of ‘hobby fowl’. In response to the risk associated with poultry imports from these countries, the number of post-import veterinary and documentary checks of poultry and hatching eggs carried out in Great Britain was increased but no evidence of Newcastle disease was found. Some 16 million birds, mainly day old chicks (see Figure 6.11) and about 14 million hatching eggs (see Figure 6.12) were imported from other Member States.



**Figure 6.11** Imports of poultry from other Member States and Northern Ireland



**Figure 6.12** Imports of hatching eggs from other Member States and Northern Ireland

There was an increase in the number of hatching eggs imported from Member States for the production of commercial poultry vaccines.

### **Captive birds**

Certain categories of birds, mainly raptors, were imported from Belgium, Germany, France and Denmark under licences that no longer required the birds to undergo post-import quarantine in Great Britain. This follows confirmation from the veterinary authorities concerned that official export health certification can be provided stating that the birds have either been resident in the country for 35 days, or have undergone 35 days quarantine in the member state. This residency requirement is in addition to the 92/65/EEC conditions and has been incorporated into national import conditions until the harmonised rules for the import of captive birds from third countries into the Community are agreed and implemented. A number of illegal imports of captive birds from Member States were detected and appropriate enforcement measures were taken.

### **Animal products**

Restrictions resulting from African swine fever in Spain were lifted following an absence of the disease over the previous twelve months. Further restrictions on the importation of animal products from Greece have also been lifted following an improvement in the foot and mouth disease situation in that country.

### **“Balai” directive**

Directive 92/118/EEC, laying down the animal and public health requirements governing trade in, and imports into the Community of, products not covered by existing animal and public health trade rules, was adopted on 17 December 1992 and was due to be implemented by 1 January 1994. The Directive covers a wide range of animal products including, among others, milk and milk products not intended for human consumption, animal casings, pet food, bones and bone products and lard and rendered fat. During 1995, Commission Decisions taken under the Directive laying down the requirements for imports from third countries of serum from equidae, apiculture products and pigs bristles came into force. Chapter 1 of Annex 1, affecting milk and milk products not intended for human consumption was replaced by a new text and Chapter 1 of Annex 2, affecting imports from third countries of meat products obtained from poultry meat, farmed game meat, wild game meat and rabbit meat was amended. Proposals detailing rules required to allow implementation for the majority of animal products were agreed by an indicative vote at the EC Standing Veterinary Committee (SVC) and sent to the World Trade Organisation for comment. Subsequent comments received from third countries resulted in the postponement of implementation of these proposals pending further consideration by the SVC.

## **Imports from Third countries**

### **Veterinary checks on animals**

Imports of live animals from third countries were subject to compliance with detailed animal health conditions which may be either harmonised EC rules or, where these are absent, national rules. Consignments may only enter the EC via an approved Border Inspection Post (BIP) and must undergo full documentary, identity and physical checks before being permitted to enter free circulation within the Community. The third countries from which Member States imported animals were set out in Council Directive 79/542/EEC, as amended. This list details by country the types of animals that were permitted entry into the EC. This is a discretionary list and if a potential import from an approved third country does not comply with national animal health conditions, in the absence of fully harmonised rules, its entry will be refused.



Disease outbreaks in approved third countries also meant that imports from those countries were temporarily prohibited. For example, imports of sheep and goats were authorised in principle from Bulgaria; but from September 1995 such imports were banned due to an outbreak of sheep and goat pox in that country.

#### **Veterinary checks on animal products**

In accordance with Directive 90/675/EEC, entry of imports of animal products into the Community from third countries continued to be restricted to official Border Inspection Posts (BIPs), with checks as to compliance with animal and public health conditions being undertaken mainly by Official Veterinarians employed by local authorities.

Due to absence of the necessary decisions in Brussels laying down harmonised import conditions and checking levels for all products covered by Directive 90/675/EEC the period in which transitional measures can be applied to the checking regime, was extended to the end of 1996. Checks continued to be carried out under these transitional measures during 1995.

Although discussions took place in Brussels on harmonised guidance as an aid to implementation of the veterinary checks regime the necessary amendments to the text of 90/675/EEC to resolve the ambiguities and, in some cases, impracticalities, experienced by Member States in attempting to operate these rules were still not forthcoming.

Veterinarians from the European Commission inspected several BIPs during the course of 1995 to check for compliance with Community rules on operation and structure. A few BIPs sought voluntary de-listing for commercial reasons. A list of approved BIPs replacing the transitional pre-selected list has now been agreed.

#### *Cattle bovine semen*

Five hundred and twenty eight cattle were imported for breeding from Canada during the period from February to 15 April. One animal reacted to a test for enzootic bovine leukosis after 4 months in post-import isolation. This emphasises the necessity for post-import isolation and testing of these imports. Seventy six cattle and water buffalo were imported from Romania, and 11 cattle from Switzerland. Bovine semen was imported principally from the United States of America and Canada, with small quantities imported from New Zealand and Norway.

#### *Swine*

A small consignment of pigs was imported from Australia.

#### *Sheep and goats*

One thousand and twenty six sheep were imported from New Zealand. A small consignment of goats was imported from Canada.

#### *Ungulates*

Interest in the production of very fine wools from the fleece of alpacas lead to a consignment of 300 alpacas being imported from Chile after a rigorous protocol of pre-export isolation, quarantine and testing.

#### *Equidae and equine semen*

Forty-two consignments from third countries were placed under restriction due to irregularities in identification and documentation including out of date laboratory results.

Post- import checks for equine viral arteritis detected a seropositive stallion from Latvia, which was gelded, and a Canadian stallion was placed under movement restrictions.

Commission Decision 95/329/EC amended the assurances required for equine viral arteritis for animals imported from third countries. It now accommodates stallions vaccinated with an approved EVA vaccine. EVA blood testing is no longer required for colt foals aged 180 days or less.

There were several changes to the list of third countries eligible to export registered horses to the European Community. Morocco was reinstated to the list and Syria and Lower and Middle Egypt were added. Mexico was delisted, except for the reimportation of European Community (EC) horses, and the temporary admission of registered Mexican horses from the metropolitan area of Monterrey. The reimportation of registered EC horses from Caracas (Venezuela) and Bogota (Colombia) was stopped due to a serious epizootic of Venezuelan equine encephalomyelitis (Strain 1c) within those two countries. The explosive and virulent nature of this epizootic was attributed to the highest rainfall in 20 years and a massive increase in insect vectors.

Vesicular stomatitis, previously recorded in USA in 1985, was first detected in horses in New Mexico in May 1995 on premises near the Rio Grande River. During the year the disease occurred in Colorado, Arizona, Utah, Texas and Wyoming. A total of 1143 investigations have been carried out, and of these 367 were positive. Seventy six per cent of the cases have been in horses but many cattle have also shown signs of the disease. The origin of this epizootic remains undetermined.

Two missions from the European commission visited the USA to assess the control measures for vesicular stomatitis and the United States Department of Agriculture agreed to provide a supplementary certificate for all equidae exported to the European Community.

Two consignments of equine semen from the USA were detained at BIPs due to out of date laboratory blood test results.

### *Poultry*

Commission Decision 95/233/EC laying down the list of approved countries for poultry imports into the Community, was implemented on 1 July 1995. Poultry and hatching eggs from third countries may only be imported into the Community from countries appearing on that list. In the absence of harmonised rules, imports into Great Britain from third countries appearing on the list continued under 'national rules'.

### *Captive birds*

In the absence of harmonised rules for the importation of captive birds from third countries, imports continue under national rules, which require a period of thirty five days in an approved quarantine in Great Britain. Import of certain categories of captive birds from Belgium occurred without quarantine and significant numbers of captive birds were imported from the continent under strict licence conditions.

The trade in adult ratites from Africa has decreased significantly. This trade has been replaced by the import of ostrich eggs and day-old chicks originating mainly from Namibia. The import of ostriches from Zimbabwe was suspended due to outbreaks of Newcastle disease in that country.

### **Animal products**

During the year, 1149 import licences, covering a wide range of meat and other animal and poultry products, were issued under the Importation of Animal Products and Poultry Products Order 1980 (as amended) (IAPPPPO) which are intended to prevent the introduction of contagious animal disease.



The adoption of Commission Decision 94/984/EC on 1 May 1995, laid down animal health conditions and veterinary certificates for the importation of fresh poultry meat into the European Community. This meant that the UK permitted, for the first time, the importation of fresh poultry meat into the UK from UK-approved establishments in Brazil and Thailand.

Specific licences are also being issued for the importation of emu meat from Australia.

The licences issued under the Importation of Processed Animal Protein Order 1981 (IPPO) and IAPPO, which cover animal meals and dry greaves and licences to import fishmeal (issued under IPPO alone), continued to operate throughout 1995.

Sampling for the presence of salmonella organisms in consignments of products imported under licences issued under IPPO continued during the year, in line with the tighter controls which have operated since 1 May 1989.

Consignments from countries with an unacceptable history of contamination with *Salmonella* spp continued to be released only when negative results were obtained. Those with positive results were either subject to further treatment, directed to non-animal feeding stuff use or re-exported.

Of the total 636 consignments tested by 31 December 1995, 55 were found to be positive. All positive results were followed up with both the importer and the exporting country.

Regarding public health, at the end of 1995, meat and meat products for human consumption could be imported into Great Britain under the Imported Food Regulations 1984 (and the equivalent Scottish Regulations) from 43 recognised third countries, provided the meat or meat products originated from premises approved as satisfying EC or GB standards. Day to day enforcement of these standards is the responsibility of the veterinary authorities of the exporting country. During 1995, veterinarians from Great Britain visited the following countries to inspect approved red meat and poultry meat products plants and poultry meat slaughterhouses: Brazil, the People's Republic of China, Hungary, Israel, New Zealand, Poland, Romania, South Africa and the USA.

While Community rules provide for the European Commission to undertake inspections of individual third country premises for a number of animal products, absence of sufficient resources has so far prevented them from undertaking this function other than in respect of red meat and meat products. To try to overcome this problem, transitional measures were adopted under Council Decision 95/408/EC, which provides for the Community to adopt provisional lists of approved premises based on guarantees as to compliance with Community public health rules from the third countries concerned. Generally, the country concerned and at least some of the premises proposed must have been subject to previous inspection by either the Commission or a member state. If that is not the case, consignments from any other premises which receive approval will be subject to 100% checks upon entry to the Community. The Commission has yet to put forward any proposed list under these new arrangements. In the meantime, as far as premises are concerned, imports remain subject to Member States' national rules.

Restrictions are still in place on the importation of food from certain third countries into the EC, following the release of radio-active substances from the Chernobyl incident in 1986, and Great Britain continues to enforce these restrictions via extensions to the conditions for the recognition of health marks.

## International Disease surveillance

*Outbreaks of major animal diseases in the European Community for the year 1995 are shown in Table 6.2 and figures 6.13 to 6.15.*

*Table 6.2<sup>1</sup> Outbreaks of major Animal Diseases recorded in the EC during 1995.*

	African swine fever	Classical swine fever	Contagious bovine pleuro- pneumonia	Sheep and goat pox	Newcastle disease	Bovine spongiform encephalo- pathy	Swine vesicular disease	Infectious haemato- poietic necrosis
Austria	0	2	0	0	0	0	0	0
Belgium	0	0	0	0	11	0	0	2
Denmark	0	0	0	0	14	0	0	0
Finland	0	0	0	0	0	0	0	0
France	0	0	0	0	0	3	0	2
Germany	0	53	0	0	29	0	0	13
Greece	0	0	0	9	0	0	0	0
Ireland	0	0	0	0	0	16	0	0
Italy	146	42	0	0	2	0	18	0
Luxembourg	0	0	0	0	2	0	0	0
Netherlands	0	0	0	0	5	0	0	0
Portugal	0	0	23	0	2	14	1	0
Spain	0	0	0	0	0	0	0	0
Sweden	0	0	0	0	2	0	0	0
UK (Incl NI)	0	0	0	0	0	14,876	0	0
<b>TOTAL</b>	<b>146</b>	<b>97</b>	<b>23</b>	<b>9</b>	<b>67</b>	<b>14,909</b>	<b>19</b>	<b>17</b>

### Foot and mouth disease

There have been no reports of foot and mouth disease in the European Community since October 1994.

### African swine fever

African swine fever was confined to the Nuoro Region of Sardinia in Italy. There were 146 outbreaks and a total of 5915 pigs were slaughtered.

### Classical swine fever

In Austria an outbreak of classical swine fever (CSF) which was attributed to the feeding of restaurant swill, occurred in the province of Volkermarkt in the southern region of Karnten. An outbreak also occurred in the province of Ganserndorf in the northeastern region of Niederosterreich.

In Germany, the number of outbreaks reduced from 184 in 1994 to 53 in 1995. In Bavaria, an outbreak in Landshut in February represented the last of a series which commenced in October 1994. Other outbreaks of CSF occurred in two areas of Germany centered on Meckleburg–Western Pomerania and Brandenburg and also in Lower Saxony. In the Lande of Meckleburg–Western Pomerania, eight primary and one secondary outbreaks occurred. In the adjacent Lande of Brandenburg, two primary outbreaks and one secondary outbreak were all attributed to fomites. The outbreaks in the Lande of Lower Saxony centred around Vechta where four primary outbreaks and two secondary outbreaks occurred. Additional secondary outbreaks were attributed to contact (8), purchase of stock (3) and to vehicle contact (1). In the adjacent kreise of Diepholtz, six secondary outbreaks were recorded. Two outbreaks also occurred in each of the nearby kreises of Oldenburg, Cloppenburg, Osnabruck and Coesfeld and one in Emsland, which were variously attributed to purchased stock (6), human contact (1) and vehicle contact (2). In an attempt to stamp out CSF, approximately 76,000 swine were slaughtered in Germany.



In Italy a total of 42 outbreaks of CSF were recorded. These occurred mainly in Sardinia in the regions of Nuoro, Oristano and Sassari, but during the second half of the year, CSF occurred in the northern mainland provinces of Bolzano (2), Piacenza(2) and Firenze. A total of 1698 swine were slaughtered during control measures.

#### **Swine vesicular disease**

Italy reported 18 outbreaks of swine vesicular disease (SVD) and a total of 10,420 swine were slaughtered. Seven outbreaks occurred in the province of Isernia in central Italy. In adjacent provinces, three outbreaks in Chieti were attributed to stock purchases and a secondary outbreak in Benvenuto to vehicle contact. In the second quarter of the year six outbreaks occurred in the northern province of Mantova where, followed an outbreak in the adjacent province of Regio Emilio. In the southern province of Matera, outbreaks were reported in two small herds of four and six animals.

In Portugal, SVD was diagnosed serologically in one imported pig in the region of Evora and the herd of 4,690 pigs was destroyed.

#### **Contagious bovine pleuropneumonia**

Portugal reported only 23 outbreaks in the northern coastal provinces compared with 69 outbreaks during 1994. Most occurred in the province of Braga, where there were 12 outbreaks. In the adjacent province to the North, Viana do Castelo, there were three outbreaks and to the south, in the provinces of Porto and Aveiro there were four in each.

#### **Sheep and goat pox**

Greece reported nine outbreaks and over 1500 sheep destroyed. Five outbreaks occurred in the Evros region close to the Turkish Border and four outbreaks were reported in Thessalonika.

#### **Newcastle disease**

In Germany, there were 29 outbreaks of Newcastle disease compared with 165 in 1994 which occurred mainly in small "backyard" flocks in almost as many different "kreises" or provinces, as there were outbreaks. A total of 30489 birds were destroyed.

A total of six outbreaks were reported in the Kreise of Donnersbergkreise, Bad Kreuznach, Alzay Worms, and the Lande of Rhineland-Palatinate. In the Lande of Baden-Wurttemberg, a primary outbreak was reported in each of the adjacent kreises of Goeppingen and Ostalberkreise.

Seven outbreaks were reported from the Landes of Saxony and Brandenburg in mid western Germany. An outbreak in Meissen was of undetermined origin but one in Seftenberg was attributed to the feeding of waste food. Further outbreaks of unknown origin, were reported, one from each of the kreises of Cottbus and Dobeln. A primary outbreak in Leipzig was attributed to the purchase of stock. One of these outbreaks, was exceptional in involving a large commercial organisation. 8000 birds died and almost 30,000 were destroyed. A primary outbreak occurred in nearby Frieberg, attributed to human contact and an outbreak was reported in the kreise of Bad Liebenwerda.

A total of 11 outbreaks in the northeastern corner of Germany, centred within the Lande of Mecklenberg-Western Pomerania in the kreises of Demmin, Neubrandenburg, Bad Doberan and Demmin again. A primary outbreak was reported from Gifforn in the Lande of Lower Saxony. Five outbreaks were attributed to the purchase of stock, in each of the kreises of Greifswald, Templin, Perlenberg, Gadebusch and Wismar and two in Parchim. Primary outbreaks in each of Lubz and Gardelegan were of unknown origin.

In the Netherlands a total of five outbreaks of Newcastle disease were reported and 1888 birds were destroyed. In the province of Nord Holland there was an outbreak in a small flock of 30 birds, two primary outbreaks were reported in the province of Utrecht and a primary and a secondary outbreak were reported in the province of Zeeland. In The Grand Duchy of Luxembourg two outbreaks were reported, both in small "backyard" flocks. In Belgium 11 outbreaks occurred in small "backyard" flocks starting with an outbreak in the province of Namur followed by outbreaks in the adjacent provinces of Liege (4), Hainaut (3), Limbourg (2) and Brabant (1).

Denmark reported 14 outbreaks, all in the last few months of 1995. A total of 1172 fowl were destroyed. Two primary and a secondary outbreak in the county of Viborg were followed by outbreaks in each of the counties of Ringkøbing, West Zealand and Copenhagen. Secondary outbreaks were reported in Ribe and one in each of the counties of Viborg and Copenhagen. Primary outbreaks were also reported in each of Ribe, Aarhus and Storstrøm and finally another secondary in Ringkøbing.

Sweden reported two outbreaks in large commercially linked units, one in the county of Malmöhus and another in Kristianstad. Thirty thousand birds were affected and over 250,000 were destroyed.

Italy reported two outbreaks, the first in a single backyard fowl in the province of Teramo in central Italy, the second in a flock of 930 in the northern province of Treviso.

Portugal reported two outbreaks in the region of Aveiro in June. Nine thousand birds died and 17,000 birds were destroyed.

#### **Infectious haematopoietic necrosis**

In Belgium two outbreaks were recorded, in the province of Luxembourg. France reported an outbreak in the department of Gard and another in the department of Hérault which were both attributed to purchases.

Germany also had outbreaks in the kreise of Cuxhaven in the northwest Lande of Lower Saxony and in the kreise of Wernigerode of the Lande of Saxony-Anhalt. Three thousand five hundred fish died and 10,300 were destroyed. In the kreise of Eisenhüttenstadt 25,000 fish were destroyed following an outbreak of unknown origin. In the region of Belgig 2000 died and 10,000 fish were destroyed. Primary outbreaks of unknown origin were reported in the kreises of Calw, Neuhaus am Rennweg and Annaberg with a total of 1200 deaths and 1020 affected. Further outbreaks occurred in the kreises of Rosslau and Schwalm Eder, and in Traunstein and in Zschopau. A primary outbreak in the kreise of Meisbach was attributed to purchases and 15000 fish died.

#### **Bovine spongiform encephalopathy**

In the United Kingdom, a total of only 14876 cases during 1995 represents a reduction for 1995 of 39.6% below the number of cases recorded in 1994 and a 57.6% decline below the number of cases recorded in 1993.

In the Republic of Ireland a total of 16 cases of BSE were recorded in the counties of Cork(6), Galway(2), Meath(2), Limerick(2) and one each in Donegal, Kildare, Wexford and West Meath compared with 19 in 1994.

In Portugal 14 cases were reported from the regions of Bragu (9), Bragança (2), and one each in Porto, Coimbra and Vila Real (Nov) compared with seven outbreaks in 1994.

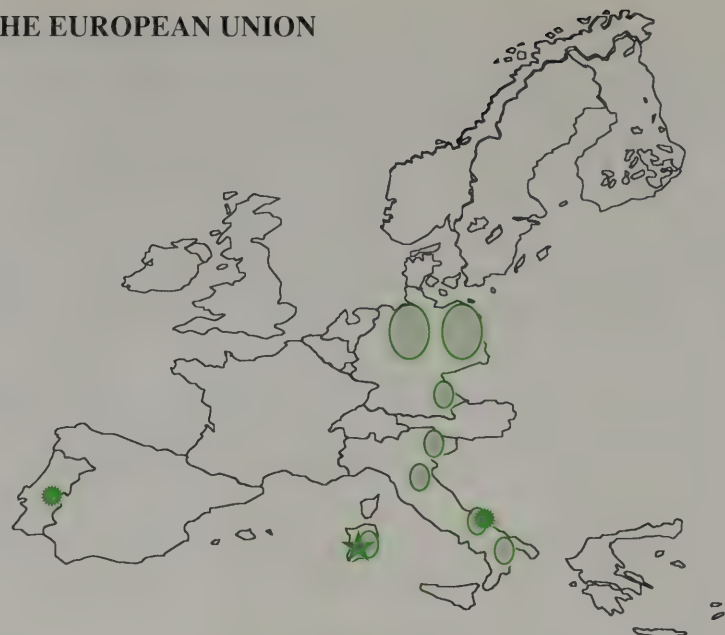
France reported cases of BSE (3) from the department of Côtes du Nord.



# DISEASE OUTBREAKS IN THE THE EUROPEAN UNION

- CLASSICAL SWINE FEVER
- ★ AFRICAN SWINE FEVER
- SWINE VESICULAR DISEASE

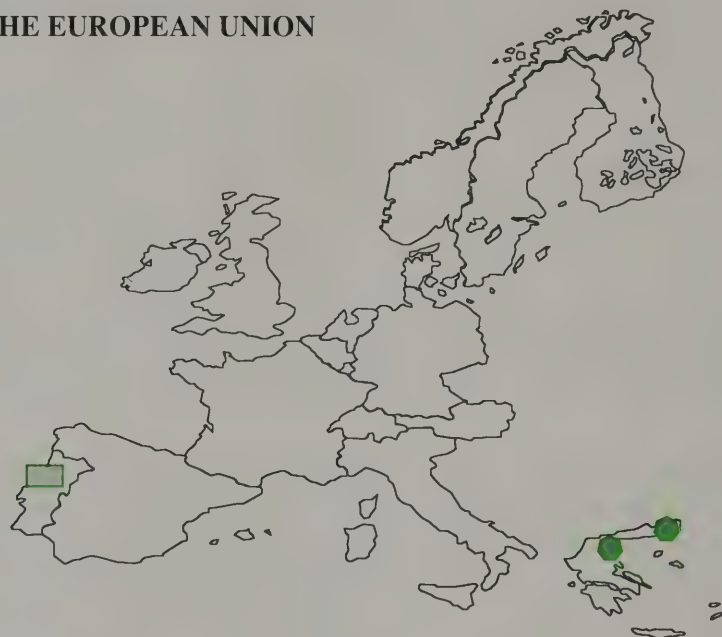
**Figure 6.13** EC regions in which African swine fever, classical swine fever and swine vesicular disease occurred in 1995



# DISEASE OUTBREAKS IN THE THE EUROPEAN UNION

- SHEEP AND GOAT POX
- CONTAGIOUS BOVINE PLEUROPNEUMONIA

**Figure 6.14** EC regions in which contagious bovine pleuropneumonia and sheep and goat pox



# DISEASE OUTBREAKS IN THE THE EUROPEAN UNION

- NEWCASTLE DISEASE

**Figure 6.15** EC regions in which Newcastle disease occurred in 1995



## Citizen's Charter Standards

The Citizen's Charter Statement of Service Standards for the Veterinary Field and Investigation Service describes the standards of service which the SVS aims to achieve and sets out the complaints procedure. Copies have been widely distributed, and are available on request.

Animal Health Offices recorded all complaints in the calendar year of 1995, the first time a full year's data has been recorded. This provided the first opportunity to make a direct statistical comparison of indicators of quality of service against the numbers of complaints received (see Appendix 1).

The level of complaints remains negligible in all areas. Of the 33 Animal Health Offices covering Great Britain at the time of report (due to the restructuring of the Veterinary Field Service), 21 offices received no complaints at all and 10 received three or less complaints. The largest total number of complaints in any one office was six. No individual office received more than two complaints in any service area. All complaints except two were dealt with at Divisional level; the exceptions were referred to the Assistant Director, and one was later followed up by Head Office. All were satisfactorily resolved. No complainants referred their complaint to the Ministry's impartial adjudicator.



## **Review of the Animal Health and Veterinary Group**

Following the sub-division of the AHVG into separate administrative and veterinary groups in 1994, the implementation of the recommendations of the Management Review of the Animal Health and Veterinary Group continued throughout 1995 with the re-organisation of the CVO's Group.

One of the recommendations of the Management Review was that the Veterinary Field Service (VFS) should be re-structured in a way that would be most economical, and would improve efficiency, but would not sacrifice effectiveness. It was clear that the VFS should continue to cover the whole of Great Britain, and that its capability to deal with disease or other emergency should be fully maintained, but that efficiency savings could be made by streamlining the management structure. This possibility was explored in 1994 by a review team led by Mr J Scudamore, Assistant Chief Veterinary Officer, Scotland. This concluded that the VFS should continue to operate from 60 locations throughout GB (a small reduction from 65), but that savings could be made by a concentration of administrative and management functions at a fewer number of offices situated strategically throughout Great Britain, in a framework of five administrative Regions.

After due consultation, the re-organisation of the VFS commenced in 1995 with a revision of the management structure and the re-drawing of regional and divisional boundaries. Regional Veterinary Officers (RVOs) and Divisional Veterinary Officers (DVOs) were re-appointed with enhanced management roles, to posts of Assistant Directors of Veterinary Field Services (ADsVFS) and Divisional Veterinary Managers (DVMs) respectively. Progress was made towards reducing the number of main animal health offices from 39 to 23. Generally, sites which were no longer main animal health offices became area offices where veterinary and technical staff continued to be stationed, in order to maintain the front line capability of the Service. The Regional Offices at Wolverhampton and Cambridge and the Animal Health Offices at Nottingham and Leamington Spa, which formed part of the old structure, were closed. The re-organisation is due to be completed in 1996.

The Scudamore review also recommended that existing plans for the merger of the Veterinary Investigation Service (VIS) with the Central Veterinary Laboratory should proceed. This took place on 1 October 1995 when the VIS became part of the Veterinary Laboratories Agency (VLA).

## Complaints received in Animal Health Offices by MAFF programme – 1995

PP1:04 BSE	
Total number of investigations	16,891
Number of complaints	2
PP1:05 VETERINARY MEDICINES	
Total number of samples collected	10,948
(In slaughterhouse, on farm and in poultry slaughterhouse)	
Number of complaints	1
PP1:03 MEAT HYGIENE	
Total number of visits	3,778
(Red meat & farmed game, unfit meat controls, poultry meat, meat products, minced meat & preparation premises and wild game premises)	
Number of complaints	0
PP2:01A BRUCELLOSIS ERADICATION	
Total number of tests carried out	63,289
(Herd tests and abortion enquiries)	
Number of complaints	3
PP2:01B TUBERCULOSIS ERADICATION	
Total number of tests carried out	33,443
(Herd tests in cattle, slaughterhouse cases cattle, herd tests in deer and deer herds restricted after slaughterhouse cases)	
Number of complaints	7
PP2:02 SALMONELLA & OTHER ZOONOSSES	
Number of samples or visits made	2,034
(IPAPO 1981 third country & intra-Community, PAPO 1989, Zoonoses Order 1989, BFHO 1993, psittacosis and surveillance in turkeys ducks & geese)	
Number of complaints	0
CE3:01A IMPORTS & EXPORTS OF ANIMALS & GENETIC MATERIAL	
Animals imported	33,884
(Member States & third countries)	
Documentary checks	45,498
(Under Directive 90/675/EEC & all other products of animal origin)	
Export health certificates issued	43,282
(Cattle, sheep, pigs and others)	
Number of complaints	5
CE3:01B CONTROL OF NOTIFIABLE DISEASE OTHER THAN BSE	
Number of visits	12,169
(MSOP, Aujeszky's warble fly, FMD, SF, SVD, VHD in rabbits, paramyxovirus, anthrax, EBL, scrapie, Newcastle disease/avian influenza, WFO, ABPO and others)	
Number of samples	12,041
(Aujeszky's, slaughterhouse samples & requests by VICs)	
Number of complaints	4
CE5:01A.1 PIG HEALTH SCHEME	
Number of members	669
(Breeding, production and combined)	
Number of complaints	0
CE5:01A.2 POULTRY HEALTH SCHEME	
Number of members	375
(Breeding flocks, hatcheries and combined flock/hatcheries)	
Number of complaints	0
CE5:01A.3 SHEEP HEALTH SCHEME	
(Accredited CAT 1, 2, 3, 4 and monitored flocks + qualifying flocks)	3,496
Number of complaints	1
CE5:01A.4 CATTLE HEALTH SCHEME	
Number of members	5,247
(Attested & Qualifying herds: EBL, IBR & leptospirosis)	
Number of complaints	3
CE5:01A.5 DEER HEALTH SCHEME	
Number of members	17
(Qualifying & attested herds)	
Number of complaints	0
CE5:01B ANIMAL BREEDING CONTROLS	
Number of premises registered for AI breeding control	6,073
(Cattle: all premises including FSU, pigs: EC & domestic)	
Number of complaints	1
AW:01.1 WELFARE ON FARMS, AT MARKETS & IN TRANSIT	
Number of visits	23,688
(Farm welfare, market welfare: VO, AHO & LVI, city farms, miscellaneous transport orders and horse sales)	
Number of complaints	3
AW:01.2 WELFARE AT SLAUGHTER	
Number of visits	1,852
(Red meat slaughterhouses, poultry slaughterhouses: licensed & unlicensed, & knackers)	
Number of complaints	0



## Animal Health Offices as at 31 December 1995

**Headquarters Offices:****Ministry of Agriculture  
Fisheries and Food**

Hook Rise South  
Tolworth, Surbiton  
Surrey KT6 7NF  
Tel: (0181) 330 4411  
Fax: (0181) 337 3640/  
330 1563

**Welsh Office  
Agriculture  
Department**

Cathays Park  
Cardiff CF1 3NQ  
Tel: (01222) 825111  
Fax: (01222) 823032

**Scottish Office  
Agriculture  
Environment  
and Fisheries  
Department**

Pentland House  
47 Robb's Loan  
Edinburgh EH14 1TW  
Tel: (0131) 5568400  
Fax: (0131) 244 6475

**Orkney**

Avon covered by  
Gloucestershire

Bedfordshire covered  
by Cambridgeshire

Berkshire covered  
by Oxfordshire

Buckinghamshire  
covered by Oxfordshire

**Cheshire**

Berkeley Towers  
Crewe CW2 6PT  
Tel: (01270) 69312  
Fax: (01270) 665315

Cleveland covered  
by Tyne and Wear

**Cornwall**

Pydar House  
Pydar Street  
Truro TR1 2XD  
Tel: (01872) 265500  
Fax: (01872) 265555

**Cumbria**

Edenbridge House  
Lowther Street  
Carlisle CA3 8DX  
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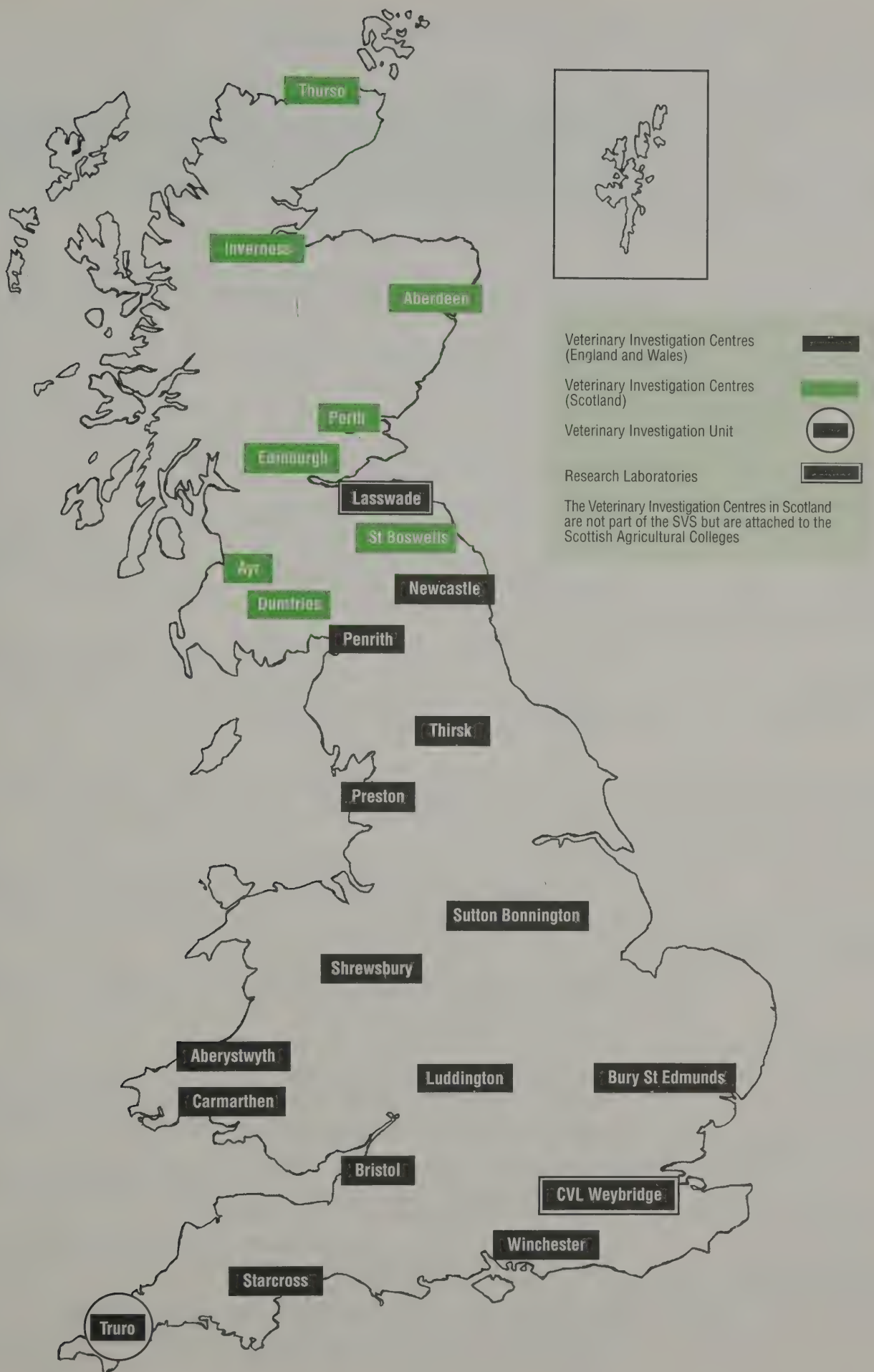
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## Selected Publications

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## Appendix 5

### Legislation

#### Acts passed in 1995

Nil

#### Acts revoked in 1994

Nil

#### General Orders and Regulations made in 1995

##### *The European Communities Act 1972*

14 March      The Welfare of Animals  
(Slaughter or Killing) Regulations  
1995 SI 1995/731

##### *The Food Safety Act 1990*

14 February	The Meat (Hygiene, Inspection and Examinations for Residues) (Charges) Regulations 1995 SI 1995/361	15 August	The Wild Game Meat (Hygiene and Inspection) Regulations 1995 SI 1995/2148
28 February	The Poultry Meat, Farmed Game Bird Meat and Rabbit Meat (Hygiene and Inspection) Regulations 1995 SI 1995/540	8 December	The Fresh Meat (Hygiene and Inspection) (Amendment) Regulations 1995 SI 1995/3189
28 February	The Fresh Meat (Hygiene and Inspection) Regulations 1995 SI 1995/539	8 December	The Minced Meat and Meat Preparations (Hygiene) Regulations 1995 SI 1995/3205
7 March:	The Animal By-Products (Identification) Regulations 1995 SI 1995/614		



*Under the Animal Health Act 1981*

5 January	Enzootic Bovine Leukosis (Amendment) Order 1995 SI 1995/13	12 September	The Animals (Post-import Control) Order 1995 SI 1995/2439
6 January	Pigs (records, Identification and Movement) Order 1995 SI 1995/11	21 September	The Bovine Embryo (Collection, Production and Transfer) Regulations 1995 SI 1995/2478
6 January	Bovine Animals (Records, Identification and Movement) Order 1995 SI 1995/12	21 September	The Bovine Embryo (Collection, Production and Transfer) (Fees) Regulations 1995 SI 1995/2479
20 January	The Welfare of Animals during Transport (Amendment) Order 1995 SI 1995/131	29 September	The Artificial Insemination of Cattle (Animal Health) (England and Wales) (Amendment) Regulation 1995 SI 1995/1549
10 July	Equine Viral Arteritis Order 1995 SI 1995/1755	13 November	Animal Health Orders (Divisional Veterinary Manager Amendment) Order 1995 SI 1995/2922
20 July	Specified Bovine Offal Order 1995 SI 1995/1928	14 December	Specified Bovine Offal (Amendment) Order 1995 SI 995/3246
31 July	Warble Fly (Scotland) (Amendment) Order 1995 SI 1995/2042		
12 September	The Animals and Animal Products (Import and Export) Regulations 1995 SI 1995/2428		

*General Orders and Regulations revoked in 1995*

The Slaughter of Pigs (Anaesthesia) Regulations 1958 SI 1958/1971	The Fresh Meat and Poultry Meat (Hygiene, Inspection and Examinations for Residues) (Charges) Regulations 1990 (as amended) SI 1990/2492
The Importation of Equine Animals Order 1979 SI 1979/1701	The Slaughter of Poultry (Licences and Specified Qualifications) Regulations 1991 SI 1991/1676
The Meat (Sterilisation and Staining) Regulations 1982 (as amended) SI 1982/1018	The Fresh Meat (Hygiene and Inspection) Regulations 1992 SI 1992/2037
The Meat and Poultry Meat (Staining and Sterilisation) (Scotland) Regulations 1983 SI 1983/704	The Farmed Game Meat (Hygiene and Inspection) (Charges) Regulations 1993 SI 1993/1359
The Slaughter of Pigs (Anaesthesia) (Amendment) Regulations 1984 SI 1984/1310	The Animals and Animal Products (Import and Export) Regulations 1993 SI 1993/3247
The Slaughter of Poultry (Humane Conditions) Regulations 1984 SI 1984/2056	The Artificial Breeding of Sheep and Goats Regulations 1993 SI 1993/3248
The Slaughter of Animals (Humane Conditions) (Scotland) Regulations 1990 SI 1990/1240	The Animals (Post-Import Control) Order 1993 SI 1993/14
The Slaughter of Animals (Humane Conditions) Regulations 1990 SI 1990/1242	The Bovine Embryo Collection and Transfer (Fees) Regulations 1993 SI 1993/2920
The Slaughter of Poultry (Humane Conditions) (Amendment) Regulations 1990 SI 1990/1243	The Bovine Embryo Collection and Transfer Regulations 1993 SI 1993/2921

## Statistical Tables

Table 1: Stock slaughtered and compensation paid 1995

	1991		1992		1993		1994		1995	
	No:	£.	No:	£	No:	£	No:	£	No:	£
Aujeszky's disease (Pigs) (1)	–	4,115	–	–	–	–	–	–	–	–
Bovine spongiform encephalopathy (2)	*29,026	15,742,464	*43,155	29,211,593	*41,085	36,290,273	*28,703	23,663,284	17,103	10,316,725
Foot & Mouth disease	–	–	–	–	–	–	–	–	–	–
Avian Influenza	–	–	1	–	–	–	–	–	–	–
Newcastle Disease	–	–	–	–	–	–	–	–	–	–
Swine fever (Pigs)	–	–	–	–	–	–	–	–	–	–
Swine vesicular disease	–	–	–	–	–	–	–	–	–	–
Bovine tuberculosis (Cattle)										
(a) Affected animals	–	–	–	–	–	–	–	–	–	–
(b) Reactors & dangerous contacts	1,304	678,916	1,626	683,831	2,455	2,081,436	2,773	2,019,911	2,896	1,988,820
Total bovine tuberculosis (Cattle)	1,304	678,916	1,626	683,831	2,455	2,081,436	2,773	2,019,911	2,896	1,988,820
Bovine tuberculosis (Deer) (3)										
(a) Affected animals	–	–	–	–	–	–	–	–	–	–
(b) Reactors & dangerous animals	30	9,145	12	4,260	27	275	25	862	–	–
Total bovine tuberculosis (Deer)	30	9,145	12	4,260	27	275	25	862	–	–
Bovine brucellosis										
Reactors & dangerous contacts	23	20,725	14	13,507	203	23,159	36	48,538	25	12,750
Total brucellosis	23	20,725	14	13,507	203	23,159	36	48,538	25	12,750
Total compensation	–	16,454,365	–	29,919,393	–	38,395,143	31,537	25,732,595	20,024	12,318,295

(1) The cost of the eradication scheme was met by the pig industry.

(2) Compulsory slaughter with compensation commenced 8 August 1988.

(3) Compulsory slaughter with compensation for deer was introduced on 1 September 1989.

\* Revised figures



Table 2: Outbreaks of notifiable diseases, excluding tuberculosis, in each county of Great Britain –1995

County	Anthrax	Viral haemorrhagic disease of rabbits	Scrapie	EBL	PMV in Pigeons	BSE
Avon	—	11	—	—	—	—
Bedfordshire	—	—	—	—	—	45
Berkshire	—	—	—	—	—	107
Buckinghamshire	—	—	—	—	—	122
Cambridgeshire	—	—	2	—	1	52
Cheshire	—	—	2	2	—	694
Cleveland	—	—	—	—	—	30
Cornwall	—	71	2	—	—	688
Cumbria	—	5	8	2	—	534
Derbyshire	—	—	1	—	—	487
Devon	—	209	11	—	—	1055
Dorset	—	7	—	—	—	725
Durham	—	—	—	—	—	117
East Sussex	—	14	1	—	—	211
Essex	—	5	—	—	1	132
Gloucestershire	—	5	5	—	—	252
Greater London	—	—	—	—	—	26
Hampshire	—	2	—	—	3	297
Here&Worc	—	3	4	—	—	267
Hertfordshire	—	9	9	—	—	105
Humberside	—	2	—	—	3	138
Isles of Scilly	—	—	—	—	—	1
Isle of Wight	—	—	—	—	—	62
Kent	—	36	—	—	3	198
Lancashire	—	3	1	—	—	533
Leicestershire	—	1	—	—	—	325
Lincolnshire	—	1	4	—	1	145
Manchester	—	1	—	—	—	15
Merseyside	—	—	—	—	2	5
Norfolk	—	—	1	—	2	515
North Yorkshire	—	1	5	—	—	781
Northamptonshire	1	—	—	—	—	135
Northumberland	—	—	4	—	—	124
Nottinghamshire	—	—	2	—	—	137
Oxfordshire	—	1	3	—	—	205
Shropshire	—	—	1	—	—	413
Somerset	—	42	2	—	—	1160
South Yorkshire	—	—	—	—	—	116
Staffordshire	—	—	2	—	1	418
Suffolk	—	—	2	—	—	215
Surrey	—	1	—	—	—	114
Tyne & Wear	—	—	—	—	1	6
Warwickshire	—	—	1	—	—	169
West Midlands	—	—	—	—	3	15
West Sussex	—	12	1	—	—	327
West Yorkshire	—	—	—	—	—	142
Wiltshire	—	4	2	—	1	576
England Total	1	446	77	4	22	12,936

Table 2: Outbreaks of notifiable diseases, excluding tuberculosis, in each county of Great Britain –1995 (continued)

County	Anthrax	Viral haemorrhagic disease of rabbits	Scrapie	EBL	PMV in Pigeons	BSE
<b>WALES</b>						
Clwyd	—	4	—	—	—	261
Dyfed	—	36	4	1	—	655
Gwent	—	5	—	—	—	118
Gwynedd	—	2	4	—	—	73
Mid Glamorgan	—	3	—	—	—	31
Powys	—	6	2	—	—	286
South Glamorgan	—	6	—	—	—	35
West Glamorgan	—	—	—	—	—	15
Wales Total	0	62	10	1	0	1474
<b>SCOTLAND</b>						
Borders	—	—	1	—	—	51
Central	—	3	1	—	—	23
Dumfries & Galloway	—	—	2	1	—	233
Fife	—	—	—	—	1	26
Grampian	—	—	4	1	—	140
Highland	—	1	1	—	—	32
Lothian	—	—	—	—	3	17
Orkney & Shetlands	—	—	5	—	—	8
Islands area	—	—	—	—	—	—
Strathclyde	—	—	5	—	—	136
Tayside	—	—	—	—	—	84
Western Isles	—	—	—	—	—	—
Islands Area	—	—	—	—	—	—
Scotland Total	0	4	29	2	4	750
Great Britain Total	1	512	116	7	26	15,160



Table 3: Summary of statistics of the principal animal and poultry diseases 1995

	1991	1992	1993	1994	1995
<b>ANTHRAX</b>					
Counties involved	2	2	2	3	1
Confirmed cases	2	2	2	3	1
Animal deaths:	2	2	4	5	—
Cattle	—	—	—	—	1
<b>AUJESZKY'S DISEASE</b>					
Counties involved	—	—	—	—	—
Outbreaks	—	—	—	—	—
<b>AVIAN INFLUENZA</b>					
Counties involved	—	1	—	—	—
Outbreaks	—	1	—	—	—
Birds slaughtered	—	624	—	—	—
<b>BOVINE SPONGIFORM ENCEPHALOPATHY</b>					
Counties involved	64	64	64	65	64
Animal deaths— Cattle	29,011	43,056	41,077	28,500	17,103
Confirmed cases (by histopathology)	22,607	34,719	36,272	25,578	13,865
<b>ENZOOTIC BOVINE LEUKOSIS</b>					
Counties involved	2	1	12	8	5
Outbreaks	2	1	25	9	7
Number of reactors	2	4	65	26	7
<b>EQUINE VIRAL ARTERITIS</b>					
Counties involved	—	—	—	—	—
Outbreaks	—	—	—	—	—
<b>FOOT &amp; MOUTH DISEASE</b>					
Counties involved	—	—	—	—	—
Outbreaks	—	—	—	—	—
Animals slaughtered	—	—	—	—	—
<b>NEWCASTLE DISEASE</b>					
Counties involved	—	—	—	—	—
Outbreaks	—	—	—	—	—
Birds slaughtered	—	—	—	—	—
<b>PARAMYXOVIRUS OF PIGEONS</b>					
Counties involved	36	42	40	22	14
Outbreaks	96	157	103	36	26
<b>SCRAPIE</b>					
Counties involved	—	—	—	42	41
Confirmed cases	—	—	—	166	116
<b>SWINE FEVER</b>					
Counties involved	—	—	—	—	—
Outbreaks	—	—	—	—	—
Animals slaughtered	—	—	—	—	—
<b>SWINE VESICULAR DISEASE</b>					
Counties involved	—	—	—	—	—
Outbreaks	—	—	—	—	—
Animals slaughtered	—	—	—	—	—
<b>VIRAL HAEMORRHAGIC DISEASE (in Rabbits)</b>					
Counties involved	—	—	—	12	32
Outbreaks	—	—	—	209	512
<b>WARBLE FLY</b>					
Counties involved	—	—	—	2	—
Confirmed cases	—	—	—	2	—

## Revenue

The following revenue was earned by the Service during the financial year 1995/96 (1994/95 revenues are in brackets)

Veterinary laboratory services provided by the  
Veterinary Investigation Service

£2,093,993 (£1,992,276)

The Animal Health Schemes

£844,525 (£852,960)













This Report describes the work of the Animal Health and Veterinary Group throughout 1995.

Disease control measures continued to be effective in protecting the health status of farm livestock. New rules for safeguarding the welfare of animals in transit came into force, and further steps were taken towards EC harmonisation and the Single Market with the introduction of new animal identification and veterinary checks procedures.

The Report is divided into the following chapters:

- Prevention and control of animal and poultry diseases
- Disease surveillance
- Livestock protection and improvement
- Animal welfare
- Consumer protection
- Imports and exports

Each chapter is sub-divided into more specific subject areas and accompanied by text illustrations, aiding the casual reader as well as providing useful reference material for those with a deeper interest in animal health matters.



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